



PROFESSIONAL

OS/2 FOR CORPORATE AMERICA  
MAY 1994, VOLUME II, NUMBER 5

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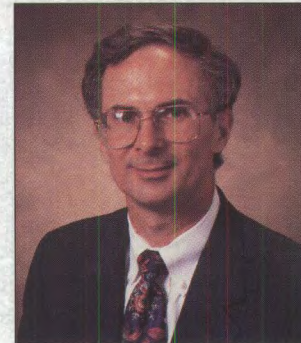
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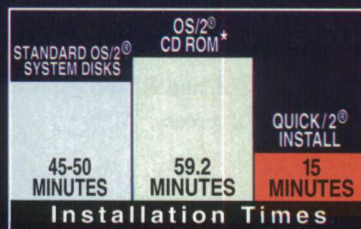
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# MAY 1994

THE MAGAZINE FOR OS/2 PROFESSIONALS

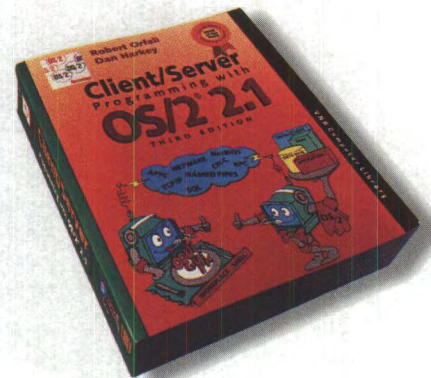
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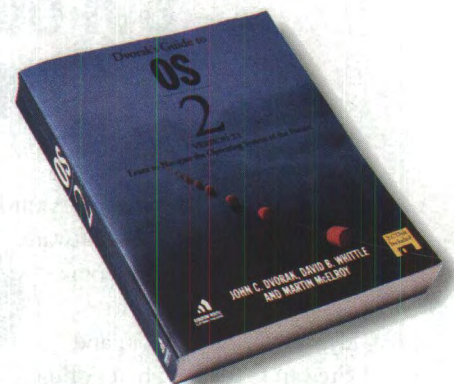
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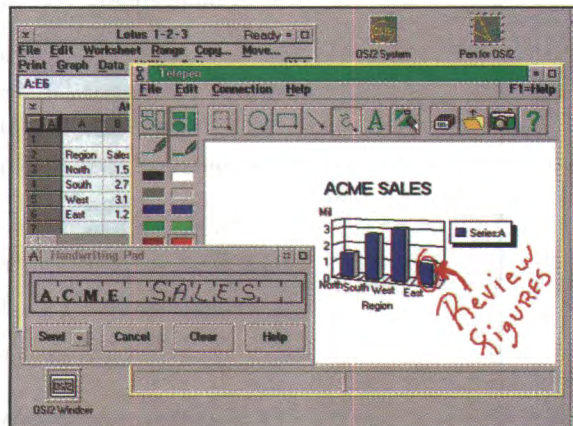
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# The Threads of OS/2

**A**s I travel through the communities where OS/2 users, developers, and vendors gather, I've been hearing people say that OS/2 isn't for everyone, that it's a product for the power user community. The more I hear comments such as these, the clearer it becomes to me that many "power users" don't have a real understanding of OS/2 and where it is going. Here are some threads of OS/2's future fabric.

Where is OS/2 going in the near term? Answer: OS/2 remains a corporate favorite and will continue to be the environment of choice for those who need desktop power and versatility for mission-critical and multithreaded applications. Why corporate? That's where OS/2 started. It was born to serve business.

The forthcoming 4mb edition, *Personal OS/2*, will be a key factor in driving additional growth among large corporations. Big companies know how expensive it would be to replace all their no-name 386 4mb machines. The idea of massively increasing productivity by loading slimmed-down OS/2 into those clunkers is attractive. *Personal OS/2* is barely in beta, but when released, it will open a vast marketplace, much as *OS/2 for Windows* did. But a word of caution: Not all 386s were created equal; performance will vary widely.



OS/2's most significant migration, however, will be downward, into the key SOHO (small office/home office) market. Small shops—the smaller the better—will be far more inclined to sink dollars into an OS/2-exploiting Pentium battlestar tower than a Fortune 500 purchasing department—after all, they're buying only one or two or maybe five. For them, OS/2 is computing nirvana, as it was for me when as a small publisher and editor I discovered OS/2. I'm still small, but OS/2 has helped me become a little less small—a few dozen desktops small.

OS/2 will expand incrementally into the end user market. As soon as late this year OS/2 will invade the home market. Here, four factors are critical.

One: Because of its multithreading, OS/2 is a dynamic multimedia machine. It's a pity that IBM has done such a poor job of exploiting that capability. But that must turn around as IBM sees

a market that will help multimedia thrive.

Two: IBM's edge in continuous speech technology gives it an obvious leg up on voice products and features home users want. That technology requires OS/2 multithreading.

Three: even if IBM can't get its act together, several leading games manufacturers have. Several will soon announce a series of major games for OS/2—and I don't mean card games.

Four: *Personal OS/2* and *OS/2 for Windows*, as well as preloading, will provide broad support for bedroom and basement systems. The key again is exploiting OS/2's multithreading capability.

The final push driving OS/2's success will—or at least should be—two-fold: one, the easy transition OS/2 provides to the PowerPC; and two, going after that monster 80 million-person DOS market that doesn't know from Windows and would cherish upgrading directly to OS/2, multitasking their DOS apps.

And now some threads from our own organization: First, we thank the Computer Press Association for awarding *OS/2 Professional* "Rookie of the Year" honors as the best new computer publication of the year. In making the award, CPA noted our independence from advertisers. Second, *OS/2 Express* is now up and furiously running with multiple sales every hour. We're now carry-

ing IBM products and OS/2 books as well.

Third, *OS/2 Professional* is proud to announce our own CD-ROM featuring more than 1,200 shareware, freeware, and demoware programs plus a library of OS/2 resources, all packed into a graphically delicious object oriented CD-ROM. Details can be found on page 12.

Fourth, thanks to the many readers who have kept us independent by converting to paid subscribers. If you have not yet converted, call 800-OS2-KWIK and say, "Steve, I want to convert!"

Fifth, *OS/2 Professional* is not hypnotized by the past. We look hard—almost hourly—at the future path of OS/2. We intend to remain on the leading edge of OS/2's horizon, keeping our readers ahead of the pack. We're cooking up some new things here. The brew is not yet completed, but it's not far off. Watch us. ♦

**Edwin Black**



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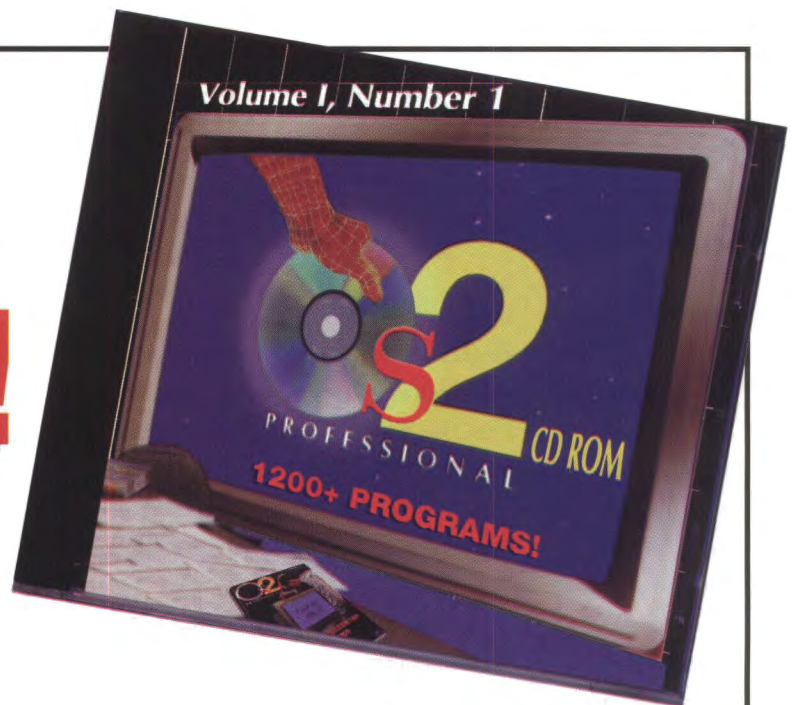
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# INPUT

*Comments, criticisms, and observations*

## Easy future

Your articles on "The Future of OS/2" [Special Report, January] were excellent. They helped put my mind at ease.

**Ernst Bak**

*Fairfield, California*

## Blazing pistols

Michael Kogan's article "The Battle for Market Share" [Special Report, January] missed the boat by a country mile.

IBM can't passively wait for other developers to port their best applications to OS/2. The best strategy is for IBM to do it and sew up the market—like Microsoft wants to do with Windows applications. Once the developers see sales being taken out of their pockets, they'll rush to port their applications to OS/2.

IBM should make strategic alliances with the best of the smaller developers. Let the developers handle the design and functionality of the software, while IBM does the porting, advertising, and especially, the retailing. Retailers also need to see sales dollars drained from their pockets to make them stock OS/2 applications.

It's time for IBM to come out with all pistols blazing.

**Frank W. Bussey**

*Toronto, Ontario, Canada*

## An independent voice

I am very pleased with the straightforward approach *OS/2 Professional* is taking in examining the future of various PC operating systems. It is a rare pleasure to read a statement such as the one Edwin Black discussed in his Publisher's Memo [January]: "The threat was rescinded after we promptly told the IBM executive to go straight to hell and not collect \$200." That sort of attitude takes a lot of guts, especially when you consider that in a sense you are biting the hand that feeds you. As a professional software developer who needs to hear the facts without the slant of

advertiser-encouraged bias, I value this independence above all else. I can think of scores of publications that continue to cling to the bosom of their advertisers, often at the cost of insulting the reader's intelligence.

**Mike Welch**

*Dallas, Texas*

*Thank you for your letter of support. IBM has and will continue to retaliate. Yet each time this magazine runs articles of that nature, readers react, respecting our independence.*—Edwin Black

## User friendly?

Edwin Black provided an interesting analysis of the OS/2 applications market when he said "the growth curve for OS/2 apps is far less steep than the growth curve for OS/2 itself" [Publisher's Memo, February]. It seems quite clear that in order to get the volume up for productivity applications, OS/2 will have to penetrate into the home and small business/home office markets. Unfortunately, unless OS/2 designers make dramatic improvements in the installation and maintenance of OS/2 for individual users, this will not happen quickly.

This point came into sharp focus as I participated (as a Team OS/2 volunteer) in the recent CompUSA OS/2 demonstration. After showing potential customers the virtues of OS/2, they are typically interested. Then, the inevitable question: "Will it run on my machine?" At this point, the responsible Team OS/2er doesn't want to send the customer home with an installation headache and create a public relations fiasco for OS/2 and CompUSA. So, we must then spend a substantial amount of time asking people painful details about their hardware, and warning them of common installation pitfalls such as turning off external cache and turbo. More often than not, this is met with a blank stare and the question "What is that?"

The same careless design philosophy

was also painfully apparent in the OS/2 Service Pak installation. Take the README.INS file, all 1,208 lines of it, for example. One is treated to a long, boring ordeal of detailed procedures described in terms of strange acronyms and file lists with arcane names. The idea seems to be that to install and service OS/2, one must go through volumes of data, sort out that which is pertinent to their specific situation, and manually carry out some prescribed routine based on the obtained data. Excuse me, but isn't that precisely the kind of activity that computers are intended to free humans from?

**Richard Hodges**

*Los Angeles, California*

## A word on WordPerfect

I think WordPerfect got exactly what it deserved [Publisher's Memo, February]. The only reason I switched from Word for Windows to WordPerfect was the promise of a native OS/2 version. Instead, after months of waiting and months of two-page ads, I received a flawed port of the flawed Windows version and more promises. When development of WordPerfect 6.0 for OS/2 was stopped, I only found out through press reports and electronic bulletin boards. The only communication I've had from WordPerfect is a glossy brochure informing me of the chance to move back to the Windows or DOS version—an offer I could easily refuse.

I might find this type of customer-be-damned behavior tolerable if I accepted the reasoning given for WordPerfect's decision to drop OS/2 development, but I don't.

The backlash against WordPerfect has nothing to do with IBM or an unreasonable OS/2 user community and everything to do with a series of mistakes by WordPerfect itself. For a company that built its reputation on customer satisfaction and support, this is not a healthy trend.

**James P. Hanrahan**

*Stamford, Connecticut*



### Quantum Leap's pricing

Thank you for reviewing our Quantum Leap product in your recent issue [DOT EXE, March]. I would like to congratulate your publication for employing reviewers, such as Rich Malloy, who conduct a thorough and enlightening review of products. His review of Quantum Leap is the most comprehensive and in-depth review of our product done to date.

Unfortunately, the price scheme for our product is incorrect in the review. The correct prices are as follows. Quantum Leap Personal Edition for OS/2: one time license fee—\$695, optional annual fee (for updates and support)—\$195. Quantum Leap Client/Server edition for OS/2: one time license fee—\$995, optional annual fee (for updates and support)—\$295.

**Joseph B. Elad**

*Quantum Development Corp.  
Claymont, Delaware*

### Letters to IBM

I have been running OS/2 2.1 since November 1993; recently, I started getting frequent Trap 000e errors. When I called IBM technical support, they advised that it was a known bug with an APAR. I was told that the fix was included in the Service Pak which would cost me \$40.

I am extremely irate that IBM has the nerve to charge for a bug fix. Although it can be downloaded from America Online or CompuServe, I cannot justify spending money to join those services just to download a bug fix. Another option is to download it from their BBS, but the long distance charges to download 21 disks makes that cost prohibitive. IBM wants to charge me and every other OS/2 2.1 user for the privilege of receiving what we should have received in our initial purchase.

IBM has turned all users of OS/2

into glorified beta testers. IBM wants us to shell out additional money to fix their mistakes. This is the antithesis of good customer service. With all the bad press IBM is receiving of late, and all the criticism of OS/2, IBM should be sending bug fixes free to any user who needs them.

**Neal J. Atlow**

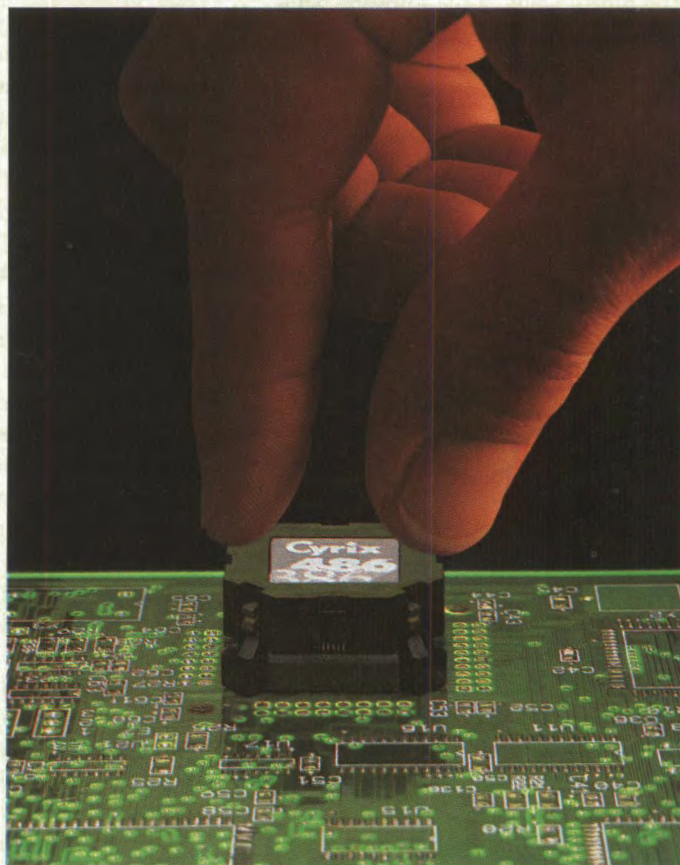
*Via MCI Mail*

*In response to user complaints, IBM recently lowered the price of the Service Pak CD-ROM to \$25.—Editor's note*

### Stop whining!

It never ceases to amaze me the quantity of whining that comes from people who have decided to abandon OS/2 after running into problems. I get so tired of hearing how much easier it was for them with DOS and Windows! Well, I say, "Don't let the door hit you on the way out!" No one ever promised

**To  
make  
your 386  
run like  
a 486,  
just push  
here.**





## INPUT

that OS/2 was for the faint of heart. It is an extremely sophisticated operating system. Naturally there are going to be problems with hardware that has basically been designed with only the likes of DOS in mind! If the hardware can't tolerate the operating system, don't blame the operating system!

Whiners don't deserve OS/2!  
Winners do!  
**Mark C. Lowe**  
DeSoto, Texas

### Down with negativity!

With the first few issues of your magazine, I was pleased to see you were up front enough to acknowledge that people had problems with OS/2 in the past. It served to prove that OS/2 2.1 had overcome the problems of version 2.0.

However, I'm now becoming alarmed at the negativity of the letters. In both December and January, you ran letters from people who think IBM

should pay *them* to install OS/2.

There are two separate issues at work here. First, OS/2 2.1 costs about the same as OS/2 2.0 when it should be free or really cheap. When 2.1 was released, it was possible to find a good price and send in the rebate coupon. Four months was a reasonable amount of time to take advantage of the offer.

Additionally, most people don't realize that version 2.1 also includes a copy of Windows 3.1. That cost was non-negotiable with Microsoft.

Secondly, I used the beta and thought I would get a free copy of OS/2 2.1. Software manufacturers as a whole are abusing the beta program. The idea was to release close-to-finished code to a few users who would pound on the program and report errors. Now, it's "give 'em an early copy so they don't buy the other guys."

Consumers see beta programs as a way to get free software. Get the beta,

use it, get frustrated with the problems and don't report them, get a free copy.

I deal with software vendors from a variety of companies. In today's marketplace, they are having a hard time making a profit. To expect any company, including IBM and Microsoft, to hand out free copies as upgrades or in response to a mass, unmonitored "beta" program is unrealistic.

**Chris White**  
Via CompuServe

*I too am tiring of the whiners and the complainers. The problem is we don't write the letters. Nonetheless, I think I'd like to move on. We have limited space and you'll see less of those letters as we explore other reader concerns.—Edwin Black*

For the past several months, I have put up with all the crying and complaining people are doing about not being able

*continued on page 77*

To your applications, it's more like a shove. Because in one simple, economical and quick operation, an anemic 386 can now run like a brand new, screaming 486.

Amazing? Yes. Smart? Of course. Breakthrough? Absolutely.

But we prefer to call it the **Cyrix® 386-to-486 Upgrade Microprocessor™**. And you'll want to call us because your applications will run faster than ever possible on a 386.

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So, you see, your 386 computers can be spared. But at what price?

Well, starting at \$269, certainly not a high one. Especially when compared to the cost of buying a 486 computer.

And not only do you get to hold on to your computers, you get to hold on to your software. Our upgrade is fully compatible with DOS, OS/2, UNIX, Windows and even Windows NT.

And of course, it's certified software compatible in Novell, Banyan and LAN Manager nodes. Installation couldn't be easier. The Cyrix 386-to-486 Upgrade Microprocessor simply snaps on top of, or plugs in instead of, your current 386 microprocessor—depending on which model you require.

All in all, it takes about fifteen minutes. Who needs downtime? Can we back all this up? Absolutely.

With our limited lifetime warranty and toll-free telephone support, we've

got all the bases, and soon all the chips, covered. So what are you waiting for? Your applications to open?

To get your hands on our Upgrade Microprocessor, just call any dealer. If they don't have it, they can order it. Or call us directly at 1-800-46-CYRIX for the dealer nearest you.

A quick recap: You get to keep your computers.

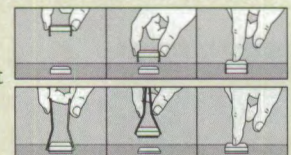
Virtually double their speed. At one fifth the cost of replacement. There. Another smarter alternative from Cyrix. The smarter microprocessor company.

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(figures indicate relative performance)	Intel 386	Cyrix 486 Upgrade
MS Excel 3.0	1.0x	2.1x
MS Word 2.0	1.0x	2.8x
Micrografix Designer 3.1	1.0x	2.6x

What kind of performance boost will you get? Depends on the 386 model you have, and your applications. But tests show performance ranges from 30% to well over 100%. As the lawyers say, your actual mileage may vary.



On DX versions, use the chip removal tool (included) to take out the existing chip, and plug in the Cyrix Upgrade Microprocessor. On an SX, just snap into place right over the existing chip. All in all, it takes just 15 minutes—roughly the same amount of time as a coffee break.

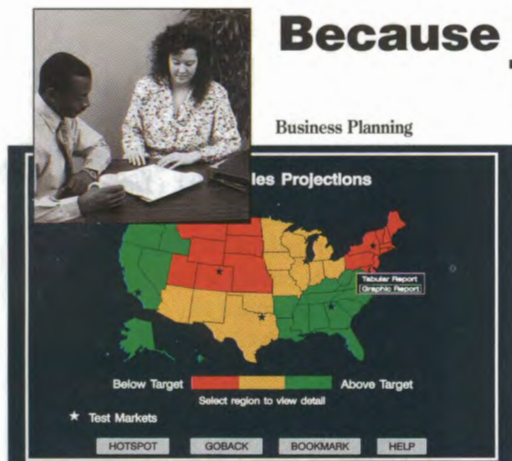
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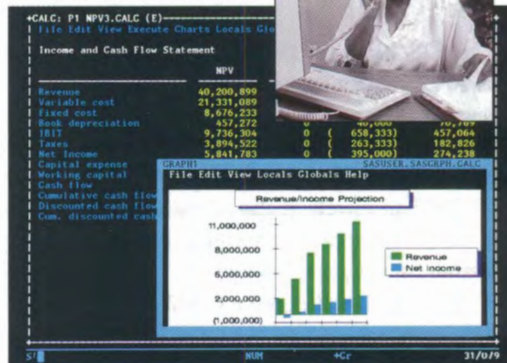


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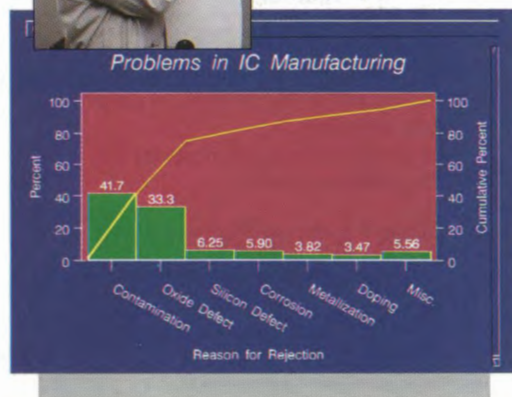
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# BYTES & PIECES

*News and trivialities, important and obscure*



## Novell's new threat

Networking giant Novell, Inc.'s decision to purchase Utah neighbor WordPerfect Corp. in a \$1.4 billion dollar stock deal has caused more than a few raised eyebrows because of the challenge it potentially poses to the dominant force in the software world, Microsoft.

Novell is a threat to the Redmond giant because it controls the vast majority of desktop communications—a direction that clearly will see significant growth. More importantly, Microsoft has been unable to compete successfully in networking, even when trying to sell comparable products for a small fraction of the price of Novell's NetWare network operating system.

Novell also has shown that it has the ability to sell products into high-end operating systems. Novell is already well-entrenched in cross-platform technology, with network operating systems based on Unix, OS/2, and VMS as well as on its native NetWare. (In fact, Novell was an early supporter of OS/2, and continues to develop products for it.)

One result of the Novell—WordPerfect merger thus may be a battle for ultimate control of user desktops. While Microsoft now controls DOS, the future is in integrated connectivity, an area that Novell already occupies. Microsoft will likely respond to the merger with efforts to increase its cross-platform support, and Novell will seek to improve the products it will now be offering. This will result in better and cheaper products for users, and better support for operating systems outside of MS-DOS, including OS/2.

The initial losers, however, won't be either Novell or Microsoft. The com-

panies that will lose the most will be those that are on the outside of the battle, such as Lotus. These medium to large companies won't have the resources to fight with cash-rich companies like Microsoft or Novell, and they won't be able to occupy a niche and wait until the smoke clears.



## Microsoft's curious bug fix

Press reports on the March release of a second maintenance upgrade for Microsoft's Windows 3.1 seemed to indicate that Microsoft was ready to allow OS/2 its place in the sun. The reports suggested the patch would make it possible for users to run OS/2 for Windows around Windows 3.11, a minor maintenance release that caused OS/2 for Windows to crash.

In fact though, Microsoft didn't rewrite its Windows code to support OS/2 for Windows. Instead, it issued a disk that installs over version 3.11 and nullifies the upgrade, returning the user to the 3.10 code. Since that's the original Windows environment OS/2 for Windows was designed to use, the effect of the change is to make OS/2 once again functional on those machines. But it does mean some users will have to choose between the bug fix version and OS/2.

Microsoft accompanied the announcement with some uncommonly sharp invective directed against IBM, which the company said had designed OS/2 for Windows "in such a way that virtually guaranteed it would break if Microsoft made any changes in Windows."

These harsh words were contained

in a March 16 question-and-answer memo distributed by Waggener-Edstrom, Microsoft's PR firm. Here are comments excerpted directly from that memo:

"From what we have been able to learn without the benefit of source code, which IBM refused to provide Microsoft, OS/2 for Windows patches Windows in memory at fixed address locations. Such a design makes OS/2 for Windows extremely fragile because it depends on Windows code being frozen over time...

"[IBM has] taken shortcuts with OS/2 for Windows that have put their customers in a bad position...IBM has the means at its disposal to permit purchasers of OS/2 for Windows to use it with Windows 3.11." Such means, according to the Microsoft document, include releasing a new version of OS/2 for Windows, supplying users with the necessary Windows 3.10 files, or making the full OS/2 product available.

IBM spokesman Keith Lindenburg said in reply, "3.11 has no performance enhancements yet Microsoft put this out and broke compatibility with OS/2 for Windows. Customers screamed, and we're pleased Microsoft put out this patch."



## LAN Server 4.0 due in September

The latest upgrade of LAN

Server, a set of minor fixes labeled version 3.01, went into general

release in mid-March. The major change in the software is a recompile optimized for Intel's Pentium micro-processor.

*continued on page 72*



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# Chips Off the Old Block

BY WILLIAM F. ZACHMANN

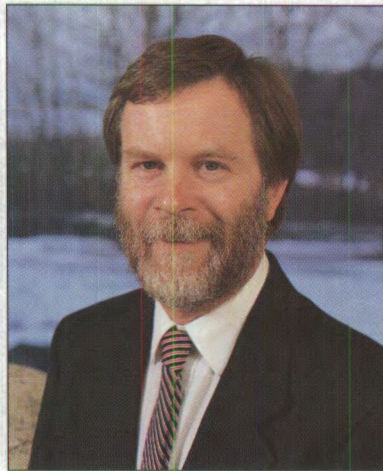
IBM's Power Personal Systems Division is either a Keystone Kops version of "The Gang That Couldn't Shoot Straight" or part of a much subtler strategy that went wrong. In fact, maybe it's both.

IBM's PPSD is the division responsible for getting IBM PowerPC Systems to market. PPSD was founded in July 1993, as the press release explained it, "to pursue new product and market opportunities emerging at the juncture between the processing power of workstations and high-performance personal computers."

PPSD's charter is fourfold. Quoting the press release once again, the division is intended to:

- "develop and bring to market a new family of powerful, advanced personal systems based on the PowerPC micro-processor;"
- "establish an industry-standard PowerPC Reference Platform;"
- participate in "the OEM market for the PowerPC Platform-compliant systems;" and
- "provide a development center for several core technologies for use in these Power Personal computers as well as in other systems."

PPSD's actual product thus is hardware, "iron"—specifically, PowerPC systems built by IBM. PPSD's public posture, right from the start, was operating system-neutral. A slide at the first major public presentation of PPSD's strategy listed as possible operating environments AIX and Workplace OS from IBM, Taligent from Taligent, Windows NT from Microsoft, Solaris from Sunsoft, and System 7 from Apple. The message to the world was, "Hey, we're hardware guys and we don't really care what operating system runs on IBM PowerPC systems."



What's wrong with this picture? Plenty! Consider these seven points:

1. Hardware and the operating system that runs on it go together like the horse and carriage of the old Rosemary Clooney song. Any systems marketing planner who believes the prospects for success for a new hardware platform are well-served by a "run on it whatever suits your fancy" operating system strategy is in the wrong business.

2. There's at least one computing company that understands that very, very well. Apple isn't messing around with any pretense of operating system neutrality with its Macintosh with PowerPC systems (I call 'em "PowerMacs" for short). Apple is pushing hard with a tightly integrated approach that marries the PowerMacs with Apple's System 7 operating system, and early returns suggest the Cupertino manufacturer may be well on its way to a smash success.

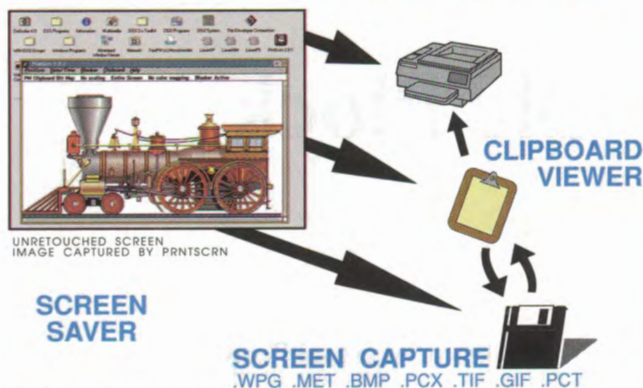
3. Neither the PowerMac hardware nor the PowerMac software is compatible with the "PowerPC Reference Platform" that IBM is promoting as a standard. Sure, IBM's PowerPC systems will run Mac apps—in emulation mode, under AIX only—but native PowerMac apps on PowerMac systems will run circles around them.

4. Apple already has far more applications software from third parties than IBM's PowerPC systems are likely to be able to run for a long time yet, and thus is far more likely to score big volume sales. In short, Apple has outmaneuvered IBM and is in a position to make System 7 the de facto standard for PowerPC systems.

5. As a result of this successful preemptive strike, the



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## ZACHMANN'S VIEW

PowerOpen Association and PowerPC Reference Platform standards effort is a shambles. The prospects for volume sales of PPC Reference Platform systems are already dim and will grow even dimmer as Apple's PowerMac sales increase.

6. As if that weren't all bad enough already, IBM PPSD's de facto sponsorship of Windows NT as an option on IBM PowerPC systems has to be one of the most absurd things yet done by "the New IBM." It is absolutely mind-boggling that IBM management allowed such treachery in its own ranks.

7. IBM's worst corporate blunder since the abortive effort way back in 1987 to return to proprietary with the MicroChannel Architecture and OS/2 Extended Edition has to be the fact that IBM has nothing better than AIX as its own OS offering. Workplace OS (or OS/2 for PowerPC, as I think it is more likely to be called), which is IBM's only plausible candidate for a real PowerPC strategy, will not be available until sometime in 1995.

Likely the head start given to Apple was simply a blunder, of a kind that is all too IBM: allowing a faction within the compa-

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## ZACHMANN'S VIEW

ny that was operating on a ridiculous assumption—that AIX on the PowerPC Reference Platform with second-rate Macintosh emulation would compete effectively against both Intel/DOS/Windows systems *and* Apple's PowerMacs—to have its way for too long.

Other factors that probably contributed include simple jealousy on the part of the AIX faction directed at IBM's Personal Systems Programming Division, which was originally charged with the development of Workplace OS, and delays in Workplace OS development. Nonetheless, that lead is real. It is now doubtful whether IBM and other vendors clinging to the PowerPC Reference Platform will ever be able to recover the initiative.

The net result will almost certainly be that IBM's PowerPC effort will remain adrift for at least a year, until Workplace OS is done. By that time, Apple's lead could be so enormous that IBM's best bet will be simply to throw in the towel and sign up as one of Apple's OEM customers for the manufacture of authorized PowerMac clones. ♦

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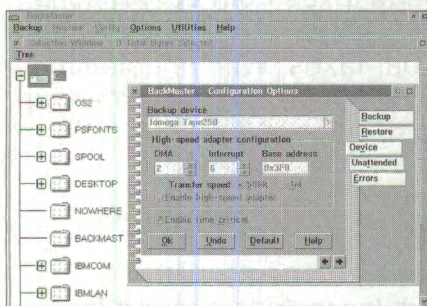
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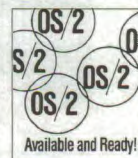
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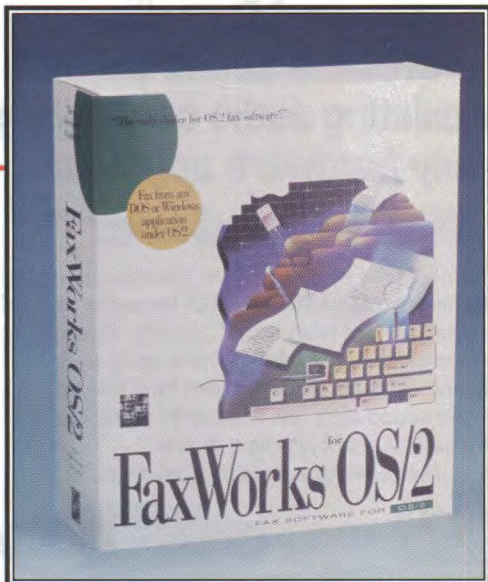
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## Q & A

*A straight-talk interview on topics of professional concern*

# The **Art** of Network Service

As more and more PCs are tied to servers, network operating systems are growing in importance to a company's information infrastructure. To get a glimpse into the future, Editor Brad Klierwer spoke in mid-March with Art Olbert, the director of LAN Systems for IBM's Personal Software Products division. An edited transcript follows.

**Brad Klierwer: The current version of LAN Server is 3.0; when did it hit the shelves?**

Art Olbert: LAN Server has been out since 1987. We shipped and announced LAN Server 3.0 in October of 1992. The next major revision will be later this year.

**Any date or quarter that you expect it?**

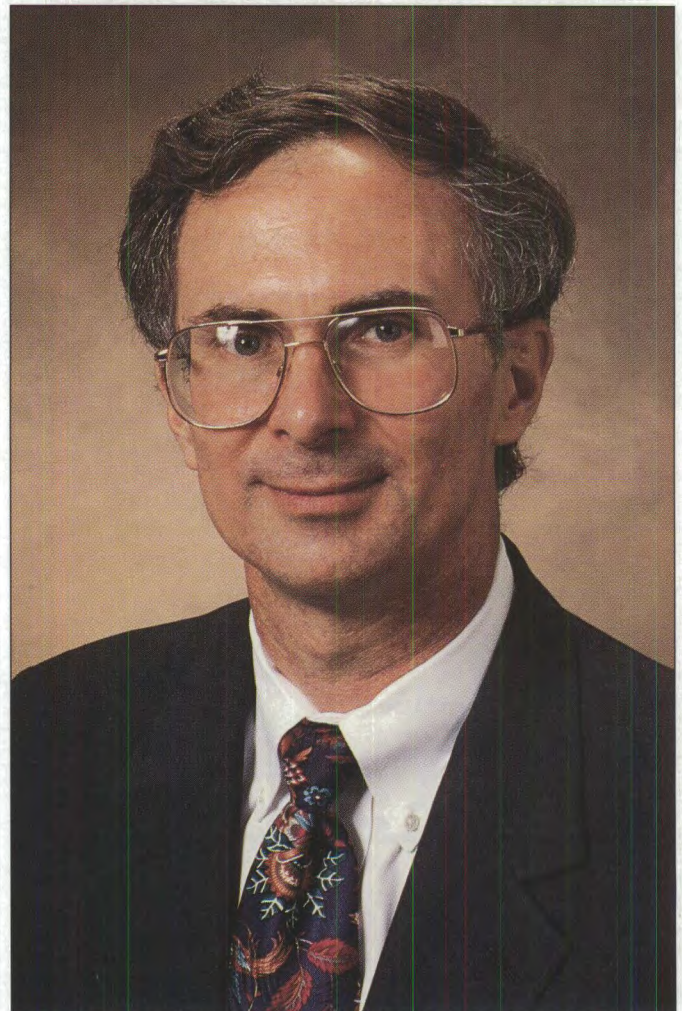
No, but we will refresh the product with LAN Server 3.01 this month. It will include a number of relatively small customer-driven enhancements to the product. It will include the roll-up of service as well as the first step of Pentium exploitation. Pentium will provide a CPU utilization reduction on the order of around 10 percent—a little under 10 percent—but it will let a customer take advantage of a Pentium in a way that no other server on the market would allow.

**Is that mostly a recompile with new development tools or have you done some other structural changes as well?**

It's mostly a recompile. There are a few changes to take advantage of the different caching. We are also working on significant improvements to the base product. Probably sometime this year we'll have another rev of the product. But it's important that our customers understand we have a track record that we expect to religiously adhere to: we will always protect customer investment. Any future version we bring out will always provide complete

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*This is an edited transcript of a telephone interview of Art Olbert, director of LAN Systems, conducted by Brad Klierwer on March 11, 1994.*

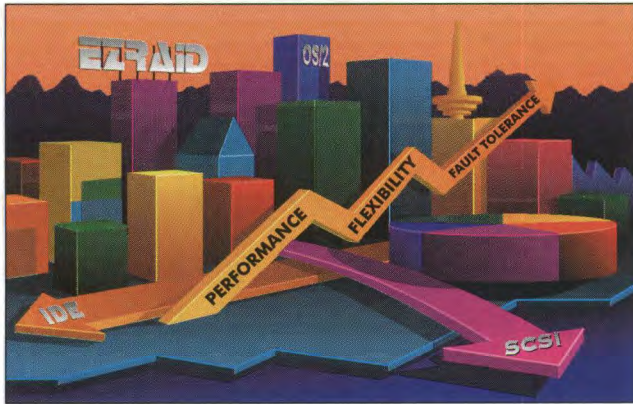




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## Q & A

investment protection for what the customer has installed at both client and server.

**So that allows the customer to upgrade only the server or particular clients that need to go up to the new version level?**

Yes. There are other vendors in the marketplace that take very dramatic steps and force a customer to make what I would refer to as a knife switch kind of conversion—you can't intermix new and old. We have a track record of never asking a customer to do that and we will never do that in the future.

**You don't tie the client or requestor pricing to the server, right? You don't sell packages of, say, 200 requestors mixed with a server?**

No, we don't. There are two major pricing models in the marketplace. One pricing model has a server price structure based upon the number of clients the server can support. The other model has a fixed price for the server and the customer pays additional fees based on the number of clients. Of the two, the one that Novell adheres to is a server fee based upon the number of ports the server will support. That's different than the model we use, where you pay a fixed price for the server and we charge for each of the clients.

It's important that your readership understand why we chose the model we chose. Because we did it in a manner we thought was very customer-driven.

**Part of the reason for that, I've heard, is that you can add a second server or third server to an existing network at a lower cost. Is that the strategy?**

Right. Our customers told us they wanted to be able to increment the number of servers and only pay a fixed price. Additionally, every time they added a client they did not want to run the risk of having to upgrade each of the servers in the network. It's, at least in my opinion, purely driven from the model that LAN Server has the capability of supporting multiple servers in a domain and other offerings in the marketplace don't.

**So as you look forward to the next version of LAN Server, what are customers asking for that isn't in the current offering?**

They want to see us maintain our performance leadership, and we will do that. We currently have the fastest server on the marketplace for file sharing. That has been validated by LANQuest Labs. LAN Server is dramatically faster than LAN Manager and NTAS, as fast as NetWare 4.0, and faster than NetWare 3. That's important to our customers.

We will also significantly improve the administration of the product and we will do it in two ways. One will be an improvement to the LAN administrator's graphical user interface.

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## Q & A

**Currently it is in character mode, so this will put it in a Presentation Manager model?**

Yes. The second thing is that a large number of our customers do not want to ever have a LAN administrator actually supporting each one of the servers. They want to completely program the administration of the server from a central site. So we'll make all of the administration APIs available in a 32-bit form which the LAN administrator at the central site may use to write, for example, a REXX [maintenance] program. You're able to do everything you want to do, but you never have to deal with a graphical user interface.

**Will you be able to record those in a macro-style capability or will it still require some planning with documentation to figure out what to do?**

You can do it either way.

**What other new features are you expecting in the next release?**

There's a laundry list of things that people would like to see—the ability to restrict users' access to disk space, there's always a constant push for higher performance but smaller memory consumption, and DOS clients. DOS clients are still very important to us. We must continually work on making sure there's enough space in a DOS machine to run meaningful DOS applications yet still have a high performance connection to the server.

**Is that by making more effective use of the extended memory areas?**

Some, and some simply honing the code down.

**Customers were originally expecting a DCE offering in version 4. I've heard this won't happen. Why the change?**

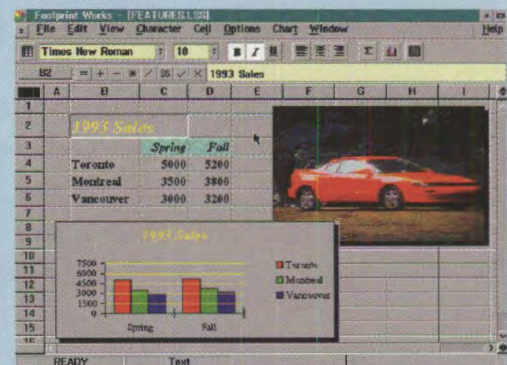
I don't know where you heard that from. We will include a DCE-based enterprise directory and security. It will be an optional add-on to the next version of LAN Server. It will be completely compatible with the existing domain capability.

We see a market segmentation for LAN—not just IBM but Artisoft, NetWare, Microsoft—and that segmentation has five different types of customers growing from small to large. There's a small office/home office opportunity, that's what LANtastic Lite went after. Then there's a small enterprise opportunity. Then there are three different types of large and medium company opportunities.

First, inside large and medium customers you'll find autonomous departments. Second is what we refer to as bottom-up enterprise LAN, which means there's a need to integrate each one of the departments (or each one of the lines-of-business's specific LAN selections). Human resources might have chosen NetWare, the engineering group may have chosen LAN Manager,

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## Q & A

and somebody else in the company may have chosen LAN Server. Third, there's a tops-down opportunity where a central group like Information Systems makes a buy decision and they deploy a whole bunch of LANs and they manage them from a central site.

The DCE-based directory for enterprise directory and security is very, very attractive to the tops-down marketplace. We also think it will be attractive to the bottoms-up marketplace and we plan on building it. We plan on deploying DCE and using its capability to integrate the entire enterprise. However, it is generally not of interest to autonomous departments, small companies, and certainly not of interest to the small office/home office. So we have no intention of forcing it into LAN Server.

We expect to continue to offer a LAN Server without enterprise directory and security, yet take the next version of LAN Server and add enterprise directory and security. So it's a family. It will effectively extend the current family that we have of Entry and Advanced Server and then have either an Entry or an Advanced participate in the DCE-based directory and security.

### **Are enterprise directory and security the main focus of DCE or are there other portions of interest?**

DCE has enterprise directory and security and it has the capability to build and execute true distributed applications as opposed to file and print and database sharing applications over the network.

### **When you say distributed, I assume this is cross-platform so that you could share it among different types of machines?**

Yes, a piece of the application executes on the client and a piece of the application executes on the server. The predominant example on the marketplace today is [Lotus] Notes. DCE allows you to find a resource in the network (that's the directory), it allows you to access it securely (that's the security or third party authentication capability of DCE), and then you have the ability to actually access that resource to run a program (that's what the remote procedure call does).

### **Would part of the security offering be a single log-on operation for various platforms?**

Yes. That capability comes with the deployment of a DCE-based infrastructure. That becomes a matter of when the other systems in the network support the DCE infrastructure.

### **So if you wanted to log onto something like an AS/400 or a mainframe you would have to enable DCE on that platform as well.**

Yes, and as we announced this week we have plans to roll out DCE on MVS during this year and early next year. We currently have DCE on OS/2 as a client. Our Unix system, AIX, is a

client and a server. In early February we announced and shipped DCE on Windows as a client. We also have the OS/2 server available in a software developer's kit and as we shake out that product and test it then we will make that available so that customers can choose among Windows clients, OS/2 clients, AIX clients, OS/2 servers, and AIX servers.

### **So the DCE currently in the developer's kit is what will evolve into the released version for general distribution?**

Yes, for the OS/2 server. I can't emphasize strongly enough that the OS/2 client has been generally available since last September and that we are the leading purveyor of DCE technology. In fact, we are the only vendor pulling this very sophisticated, very useful technology from the Unix space into what we might refer to as the IBM PC-compatible space.

### **One of the things we sometimes hear in relation to a small office or home office environment is peer networking. Will we see an offering this year in that arena?**

We currently have peer function in OS/2 LAN Server 3.0. We have worked with customers to find out exactly what they'd like to see in a peer. We have found that there are two different configurations of a peer. There is what I would refer to as the true white-collar peer. This means there are two professionals using the systems who want to share either information or a resource between them and are willing to bear the administrative burden of that sharing.

If I'm sharing something with you over a network, unless I trust you to have complete access to my hard disk, I'll require some level of administration between you and me. Some people are willing and eager to do that. We have a product in development to satisfy that need. We have it out in the hands of some people and we're getting very good reaction to it.

### **Will there be any type of centralized administration or is it totally at the individual level?**

The idea is that it's at the individual level but that the peer product will allow, for example, you and me to share resources between us. Additionally we could each transparently connect to a server and share information with other people who don't want to bear the administrative burden [of a peer network]. We put the administrative responsibility onto the LAN administrator for the server.

### **When should we expect to see the peer offering?**

We will probably put it into beta in the first half of this year. We will probably ship it before the year is out.

### **Fourth quarter of 1994?**

Probably. At the same time we found that interest in peer, we also



## Q & A

found an interest in peer that's really not peer-to-peer computing: it's really a simple version of client/server. We are also working on a peer capability for the DOS operating system.

**That would integrate with these other offerings?**

Yes.

**I've also heard rumblings about some integration with services on the AS/400 and LAN Server. Is that something we should look for as well?**

Between now and May we will announce AS/400 LAN Server, which is the inclusion of LAN Server technology inside the AS/400.

**So instead of using, say, PC support to get LAN-style access to the AS/400, you would treat the AS/400 as a LAN Server itself?**

The intent here is to have it look as if the AS/400 is indeed the server to the customer. Actually it is a connection of client to LAN Server and then LAN Server to AS/400. It's a hardware and software addition to the AS/400. We are literally putting a PC and a LAN Server inside the AS/400.

**I'm curious about your current market penetration. How is LAN Server doing in the marketplace?**

Our market share for LAN Server increased faster than any other network operating system in the first three quarters of 1993. I don't have the latest IDC data for all of 1993, but our share grew by greater than a 20 percent rate. We're starting from a small base, but our share according to IDC is now around 8 percent. The important thing for your readership to know is that that is second to the combination of the NetWares. LAN Server's market share is higher than LAN Manager, it's higher than PathWorks, and it's higher than VINES, according to IDC.

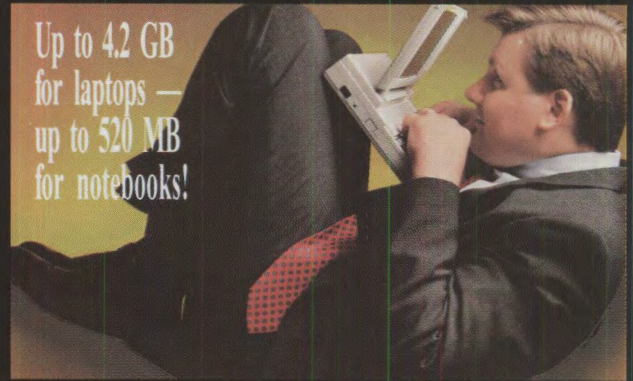
**What would you attribute that to? Are you partly running on the coattails of OS/2? Or do you think LAN Server has evolved into some new offerings that make people want to go over to LAN Server as a product in its own right?**

We work with a large number of customers who don't have OS/2 clients. All they want is a high performance, stable server system with the multipurpose capabilities of the OS/2 LAN Server. Clearly the focus on OS/2 has been beneficial to LAN Server, but we've had a focus on LAN Server in and of itself, both from a development and a marketing side. I don't know whether you know it but we've announced with NCR that we will put LAN Server onto various Unix systems. So yes, we think we are gaining share and customer loyalty outside of an OS/2-only thrust.

Thank you, Mr. Olbert. ♦

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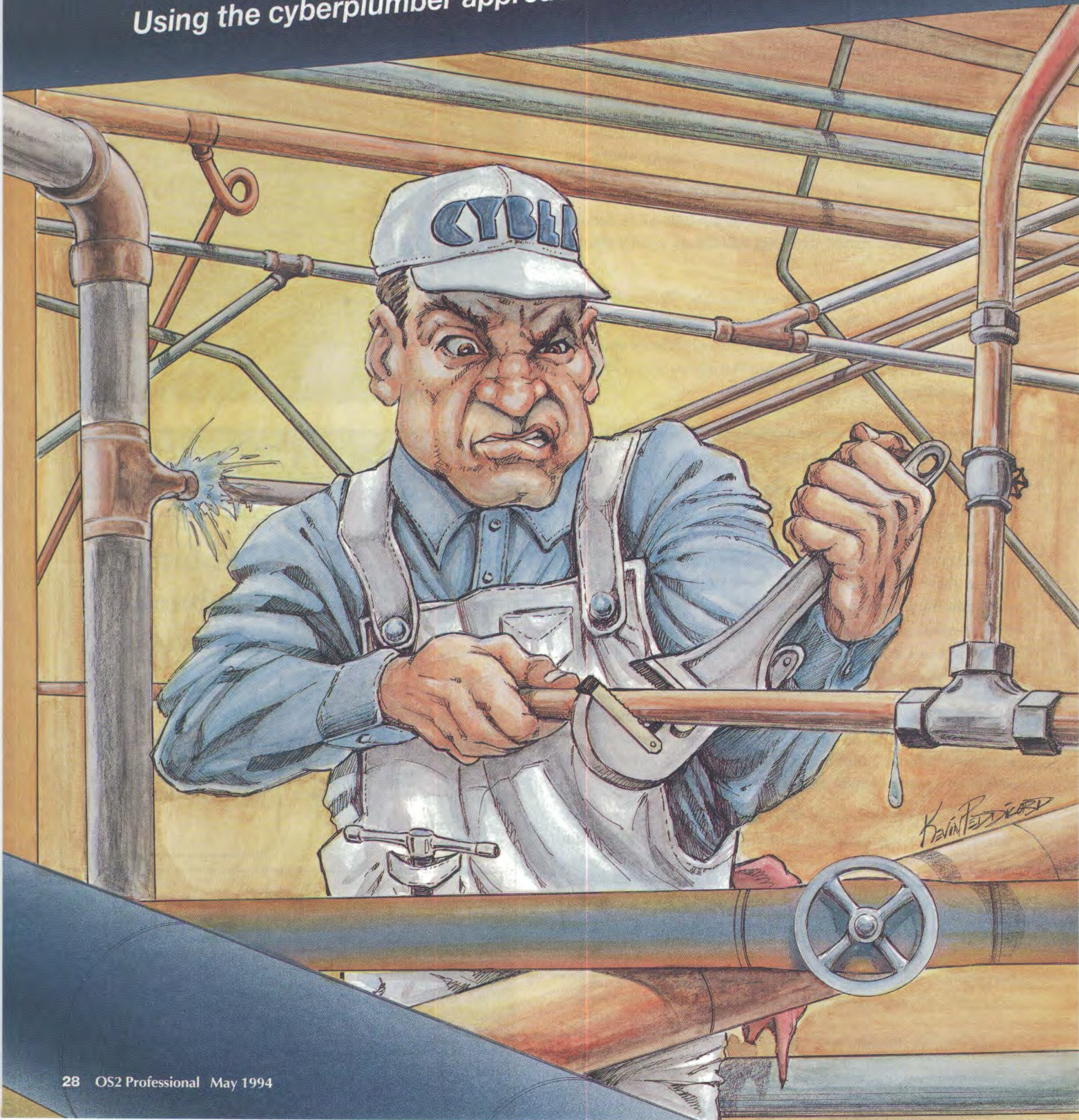
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SPECIAL REPORT

Using the cyberplumber approach—hanging new additions onto the





*client/server system—is likely to result in an unmanageable environment.*

# **THE MONKEY WRENCH FACTOR: CHANGING THE FACE OF ENTERPRISE ARCHITECTURES**

First there was the glass house. Then IT components moved out to business sites.  
Is the pendulum swinging back again?

**BY WAYNE RASH JR.**

**F**or years, the trend in enterprise computing has been away from the data center—what computer professionals call the “glass house.” That’s more than a shift in the location of information processing equipment. The introduction of cheap, reliable personal computers led to a break in the monopoly held by an elite band of MIS professionals when it came to providing computer resources. Companies found their employees buying computers and installing them in their own departments, using commercial software to meet their computing needs, and at the same time saving money and making their data systems much more responsive to their specific needs.

For a while, this move away from the glass house was applauded by most data managers. But a few hard core MIS professionals decried the trend, issuing dire warnings about compatibility and security. Most in the personal computer industry laughed off such warnings, and aggressive marketing and the strategic advantages of desktop access to data continued the spread of computers to the workplace.

Suddenly, though, things have changed. People have begun to listen to the MIS pros when they talk about the risks of distributed computing. Even more, many are beginning to rethink their decision to free themselves from the reins of the data center managers.

Is it possible that MIS is about to bring about a return to the glass house?

As always, that depends on who you ask, but there’s a grow-

ing agreement in the industry that some centralized control is needed in today’s business environment. “One thing I find interesting is that people who aren’t old enough to remember the mainframe era are realizing that if they put everything in one room, it’ll be safe and easy to manage,” says Ed Ward, a senior principal at American Management Systems, Inc. in Arlington, Virginia, and that company’s network services manager.

Ward thinks companies are just now coming to realize that having based some of their most critical business applications on distributed and client server systems, they now have to manage those systems. According to Ward, this means they must provide security for the data, back it up, arrange for a response to potential disasters, and even define corporate standards (including, but not limited to, how files are named). “Just because they’re dealing with small computers doesn’t mean it’s easier or cheaper to manage,” Ward notes.

Ward says that companies often embraced enterprise computing without thinking enough about the impact on the organization. “It has not been an enlightened use of the technology,” he notes. People were able to do more work, Ward says, but in many cases it wasn’t necessarily work that was an efficient use of time or company resources.

## **Centralized Control**

Louise Herndon Wells, director of IBM internetworking for the Internetwork Technology Institute in Milpitas, California, says



## SPECIAL REPORT

the difficulties that came with the move to enterprise computing are now leading to a movement back toward centralized computing. While both efficiency and responsiveness are important, she says, "Americans don't like trade-offs." As a result, computing is experiencing a series of pendulum swings between the two extremes.

Wells notes that the drive toward decentralization has been fueled by a number of important changes in technologies, including the growth of PCs. But as freedom in many enterprise sites has become a license to create a hodgepodge of heterogeneous computing environments, the seeds of a reaction have begun to sprout.

"There's a lot to be said for independence," Wells says, "but people are starting to realize that there have to be guidelines." Wells points out that these guidelines—such as the type of application software that will be supported or, on a more basic level, what network protocols may travel on a company's enterprise network—will shift computing technology in a direction that will allow more enterprise-wide management of geographically distributed systems. "That's why SNMP [the simple network management protocol] is being enhanced," Wells says.

The short-sighted IS planning of recent years is also contributing to the move back to centralized control of computing resources. "Companies have been approaching client/server as 'cyberplumbers,'" Ward explains, "They hang things off the client/server system whenever they need something."

The cyberplumber approach, he says, has resulted in extremely complex computing environments that are essentially unmanageable. As a result, "You can use the plumber approach," Ward says, "but you cannot do it indefinitely."

IS complexity is exacerbated by other forces as well. Key among them is a technology analog to the American "Manifest Destiny" drive that opened and ultimately eliminated the western frontier: universal connectivity. "Every desktop is being connected to the enterprise," says industry analyst Michael Howard, president of Infonetics Research, Inc. in San Jose, California. Howard points to the growth of branch and remote office connectivity and the increase in IT support for telecommuters and even travelers as factors making the enterprise computing environment ever more complex.

Howard thinks economic forces are driving the move to greater centralization as well. "We did studies in 1989 and in 1993 of the cost of down-time in the Fortune 1,000," Howard said. "We

found that the average cost per company per year for computer and network down-time increased five times." Howard said that the average cost per company in 1989 from downtime was \$650,000; by 1993 the figure had increased to \$3.85 million. "We feel this is a measure of how much companies are losing because of the move of their critical applications to enterprise systems."

Other economic factors are at work as well. "As we get more optical storage available," Wells says, "we're going to have 'billions and billions of pieces of data that people will want access to right away.'" That need for vast quantities of central storage, plus the greater power demanded by graphical and multimedia applications, will force more centralized computing.

Wells argues that the value of company data requires not only universal accessibility but security as well.

Howard agrees, and thinks that ease of management will be a key factor pushing toward greater centralization in the storage and control of information. "It [customer demands for more power] will enable more specialized applications," Howard says.

### A Centralized Future?

Will the combined pressures of security, efficiency, and economics bring about a return of the centralized approach to corporate computing? Perhaps, but few think that the pendulum will actually swing all the way in that direction.

It could, though. Part of the reason is that enterprise computing is still not as mature as the old central computing approach, and that means that some key activities are hard to do in an enterprise computing environment.

"What's missing are MIS-quality management tools, including backup capability," says Howard. He argues that companies increasingly are realizing that their valuable distributed data is not being managed as well as it would be in a centralized mainframe computing environment. For this reason, he says, "MIS people are being forced to take control of networks."

Howard doesn't think that all enterprise computing control will necessarily come to reside in one central location, however. Part of the reason is inherent in the technology. "As a network gets larger, it requires more network traffic to manage it," Howard points out, and "you could eventually reach the point where all of the traffic on the network was management traffic."

As Howard notes, in an enterprise computing environment, only so much centralization is possible. Beyond a certain point, centralized management requires so much exchange of informa-



tion that the traffic required to manage the network requires the entire capacity of the network. This is combatted by breaking management tasks into smaller parts, and decentralizing them.

The difficulties inherent in centralized management of an enterprise network will lead to a compromise, in Howard's view. "It will be a centralized distributed approach," he says. This means that management tasks will be physically distributed, but that they will be under the control of a central management philosophy.

You might have network control centers in a company's Washington, D.C. headquarters, for example, and also have management sites in Chicago, Denver, San Francisco, and Tokyo. Each of those management sites would manage its portion of the enterprise, but they'd all be under the direction of the Washington headquarters, and would follow the same standards, including things like naming conventions and backup frequency, followed by the headquarters.

Howard points out that many companies are already moving in that direction. "Management moves around the world with the sun," Howard says, describing the way some large companies handle their management tasks, "but there's a central view and a central control of that view."

Wells thinks that one reason users will be more open to a move back to some form of centralized control is that MIS departments have become more service-oriented. "Data centers are fighting for their lives, and they realize that if they aren't responsive, they'll lose their budgets and their jobs," Wells says. She thinks that users will allow MIS professionals to resume some of the functions on the enterprise network that they once performed for the entire corporation, "especially disaster planning and recovery," Wells says.

### Dealing with Complexity

Ward thinks that the complex nature of today's enterprise environment will prove to be key in helping MIS departments regain some of their lost stature—the modern enterprise computing environment is too difficult for many users to handle. "A multi-vendor environment used to mean that there was one vendor for the computer, one for the tape system, and one for the disk drives," Ward says. "Now you have more vendors than that inside a single PC. Enterprise computing now comes in kit form."

According to Ward, it's impossible to find a single-vendor solution for enterprise computing. Instead, companies, or their systems integrators, must choose products and services that are

commercially available and make them fit into an integrated whole—and in the process, work together. Ultimately, this means that every enterprise solution is custom-built—a unique response to the needs of a particular company. While this makes the computing environment fit a company's needs more closely, it makes the task of management more complex as the IS staff works to find ways to keep a handle on the many vendors and their individual management requirements.

Still, IS executives will run into problems in any move to return to the culture that accompanied more centralized control. "Actually," Ward says, "centralized computing was never the problem. It was the unresponsiveness of central computing. Users wouldn't care if the computer was in Katmandu if they got the support they need."

What will it take? Ward thinks that as people in companies find they need to work with others in the same company, either by sharing information or by being involved in processes that move information from one person to another, they will see the benefits of an architecture that imposes some consistency on the computing environment. "People will accept such an architecture when they have to interact with each other," Ward predicts. He feels that the desire for such interaction, and the accompanying need for an architecture consistent enough to allow it, will bring users to the point that they will accept at least some limited central control.

Without user support, however, any attempt to force users into a specific architecture is doomed, in Ward's opinion. "In a LAN environment it's easy for users to subvert any architecture. For an architecture to be accepted, users must think they're getting something instead of giving up something."

What will that something be? Wells and Howard think that multimedia and video services, both which require the specialized support that an MIS staff can best provide, will be the key. Still, MIS will probably never have total control. "We're moving back, but we're moving more wisely," Wells says.

Ward agrees, noting that while companies are getting architectural issues back under control, "They still have to worry about responsiveness to users."

"It's the only way companies will be able to manage," says Howard. ♦



# OS/2's Been Working

**CSX Transportation's decision to go with OS/2 has allowed the giant railroad company to speed down the track towards reduced costs and increased productivity.**

**CSX** Transportation, with headquarters in Jacksonville, Florida, is one of the eastern U.S.'s largest railroad companies—and with approximately 1,300 trains a day running over 18,800 miles of track, CSX's business is by nature mission-critical.

The challenge for CSX Technology, the company's IS arm, is to provide this national transportation company (formed by the merger of the Chessie System and Seaboard Coast Lines) with the information systems it needs to manage both the railroad and the business. That's a pretty hefty burden: Because of the railroad's vast infrastructure and the diversity of the cargoes it carries, its managers must have real-time decision support and automated systems for scheduling, resource allocation, and process control.

As the 1970s became the 1980s, CSX evolved a distributed yet mainframe-based information strategy to serve the company's four major business areas: operations, customer service, sales/marketing, and office productivity. A central computing facility was set up in Jacksonville, and information collected throughout the rail network is sent there for storage and processing.

But as was the case in so many business environments, desktop computers arrived in the 1980s. Initially they were individual productivity tools, but they quickly became an MIS responsibility. Before long, CSX information managers were finding the rapidly increasing number of platforms and architectures, networked among themselves and tied in various ways to the Jacksonville data center, increasingly costly and difficult to support.

By the end of the decade, just about every permutation of client/server and client/host architecture existed somewhere in the company. The result: redundancy and poor maintainability that impacted CSX Technology's ability to deliver strategic information as needed.

## Yes, Client/Host

Like any train, CSX Technology is led by an engineer. George Sekely, senior vice president of CSX Transportation, put in 10 years with IBM in the 1960s, followed by 20 years running the information systems at Canadian-Pacific





on the Railroad...





## FEATURE

Rail. When Sekely arrived at CSX Transportation in 1991, he moved quickly to streamline its information technology operations. His strategy: a client/host architecture using OS/2 clients.

Client/host? Not client/server? Right, says John Andrews, vice president of CSX Technology. "Our operating environment doesn't require us to distribute the data to the field. All we see are increased costs and tremendous risk. Using client/host we feel like we're connected to every part of our organization."

Sekely says, "I want network computing so wherever you go your entire infrastructure is available. But a LAN used any way other than as a wiring solution is an inhibitor to flexibility—it

computing universe: there's some of everything. The glass house contains IBM and plug-compatible mainframes by Amdahl, among other manufacturers, with connectivity provided over direct coax cable. Over 14,000 dumb terminals use 3270 and 5520 protocols. There's Ethernet (being phased out), Token Ring, and some fiber. LANs are everywhere.

CSX's client/host strategy is based on the newer LU6.2 protocols rather than the older 3270 protocols. The custom applications on the client have some server-like functions that retrieve data from the host using LU6.2 verbs for communication. In the future, CSX is looking at APPC as a more robust communica-

tions protocol, and CICS OS/2 for distributing its transaction processing. Ruby Raley of sales and marketing development describes the system being planned as a "way to leverage our existing mainframe programmers and create some custom tools for giving us better access to the host."

### Why OS/2?

When it came to selecting an environment for CSX's rail and office productivity applications—an environment that could deliver multitasking, data protection, and connectivity—Sekely concluded that OS/2 was the only system that made sense. "We needed a multitasking facility in the PCs, and DOS would not handle it. We could make DOS or Windows do what we needed, and it would probably handle our loads for the next few years, but it would be

messy and we'd have to redo it again. Although Windows has some lovely stuff in it, it's still DOS-based and is not the system for business.

"At the time of our decision, OS/2 was the only candidate that provided the serious multitasking, protection, and reliability that are necessary to interface efficiently to our network. At the time it was the best business decision, and I still think it is."

What about Apple and Windows NT? "Apple is incredibly complicated to work with, especially when used for mission-critical clients. Since Windows NT was positioned primarily for servers and had such high resource requirements, it wasn't much of an option for us."

Joe Vasconcellos, a manager in sales and marketing development, adds, "The focus for us is on the client, and Windows NT



Photo: Left to right: Joe Vasconcellos and Ruby Raley, both of CSX sales and marketing development, and Bob Hammel of CSX Technology operations development. The wall screen behind them is one of many Yardmaster workstations at CSX.

casts you into an electronic corner from which you cannot get out. With client/host I can move and restructure the business without impeding our ability to access information resources."

Client/host allows CSX to avoid the costs of staffing, training, and maintaining the server tier, while exploiting the existing processes, mainframe MIPS, and programming expertise that have evolved over time. A client/host architecture also makes it easier for CSX to ensure system reliability.

As Andrews says, "These applications that drive our business are mission-critical and real-time. If we had more potential points of failure it could cause real problems. Also, a second tier would create a lot of data redundancy, and we are data rich. Synchronizing that data and keeping it current would be a nightmare."

CSX's technology infrastructure is a microcosm of the business



## FEATURE

is just not appropriate for the client. When we needed a solution NT was not there, and it's still not there today."

### OS/2 in the Office

CSX has about 6,000 PCs, running a variety of operating systems, including DOS, DOS/Windows, and OS/2. They are used primarily as intelligent terminals for accessing the host and running productivity applications. Most of the administrative and support personnel use MERLIN, an office automation application suite originally developed at Canadian Pacific, for e-mail, word processing, and office support.

According to Sekely, "MERLIN provides tight integration between its programs, and uses asynchronous communications to give good interactive performance—like a PROFS that works well."

Because MERLIN takes care of most internal productivity needs, Sekely sees no reason to standardize on off-the-shelf productivity tools. "Whose productivity are you talking about? What is their relevance to the transportation business? Most of these applications are super-rich for our needs. As a responsible business executive, I don't want people playing with PCs in this company—I want them to use the applications we give them to make money."

### Sales and Marketing

The sales and marketing force is the first point of contact for a CSX Transportation customer. Its representatives are responsible for bidding on transportation jobs, performing market analyses to support pricing decisions, and creating contracts to complete a sale.

In the past, the sales and marketing groups got by using PC-based applications such as WordPerfect and Excel. Now, CSX Technology is creating a custom OS/2 application to streamline bid analyses and the contracting processes. The application uses pre-approved legal paragraphs stored on the host to make possible the rapid customization of contracts based on customers' requirements. Using DDE, sales and marketing representatives will be able to integrate data from the host to make effective presentations to the customer.

It is in the area of operations that things get really interesting. For CSX to keep the trains running on time and profitability high, operations at CSX must be able to integrate rapidly a huge number of inputs from the railway's infrastructure and customer service desks. Whether the task is locating a locomotive in the Atlanta area, managing a train yard in Charleston, finding a replacement train crew in Virginia, or telling a customer when her coal will arrive, reliable data must be available company-wide.

Work flows and an understanding of the business processes

play a large role in the development of CSX's systems. The work processes of the train business have evolved over a long period of time; they're quite mature and well-understood. Rather than attempt to change them, the CSX Technology team is trying to improve the existing processes. Says Andrews, "Our user community is used to a certain way of doing business, and we have to work very closely with them to produce products which make them more efficient without forcing them to change mature processes that are in place."

Tours of the various railroad sites and operations are used to orient CSX developers, and they work closely with rail personnel during development and deployment of new systems. As Mike Munley, director of operations development, notes, "We've spent a great deal of effort and time for our people to learn the railroad business, and now we are reaping the benefits as our OS/2-based systems are deployed."

Most of the operations applications start with a map—a graphical geographical representation of the rail network. Depending on the application and the task at hand, different levels of detail and control are available to the user. Says Munley, "One of the things that nearly every application at CSX needs is a 'What's going on out on the railroad' view of the system. We're developing a generic drawing object which allows you to draw any data or view you want on the railroad map."

### Customer Support









The Customer Service Center (CSC) is the portal used by customers to track the transport of their deliverables and interface with the rail operations group. Currently, the CSC uses about 1,000 Apple Macintosh systems to track the transport of commodities across the rail network. They run a graphical application based on the generic railroad map object, and are able to retrieve shipment and operations status from the host so that the

### *At a Glance:*

**Company:** CSX Transportation  
**Founded:** In 1980 by the merger of the Chessie System and Seaboard Coast Lines  
**Headquarters:** Jacksonville, Florida  
**Employees:** 29,000  
**Ownership:** Publicly traded on NYSE  
**1993 Revenue:** \$5.2 billion  
**1993 Operating Income:** \$799 million  
**Number of route miles operated:** 18,800 miles in 20 states, D.C., and Ontario, Canada  
**Number of trains dispatched daily from centralized dispatching center in Jacksonville:** approximately 1,300 trains



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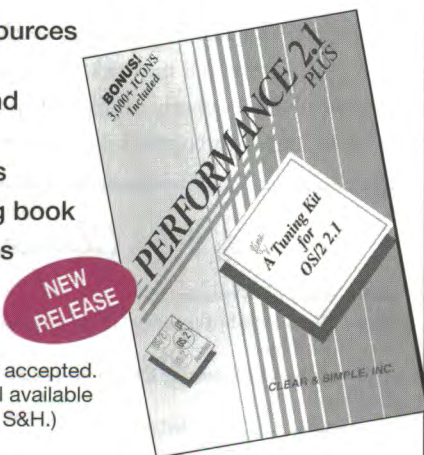
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customer representatives can easily provide status reports to the customer.

Since the CSC operation is growing, CSX is moving Apples from administrative desktops into the CSC; down the road, though, it will port the CSC to OS/2. Sekely notes, "Although we're not buying any new Apples, we are not throwing away the fallen Apples. We're moving them to our CSC, which is still growing. When it's time for the next rewrite in two or three years' time, we'll redo the whole thing with OS/2."

### Locomotive Management System

Locomotives are one of the largest assets of a train company, and rolling stock managers need to know where they are. Locomotive managers typically are bound to a dispatch center, the walls of which are lined with screens showing the rail system. Using the screens and the data they convey, the locomotive managers control the movements of trains and track their status, contents, and history.

The Locomotive Management System workstation, a 486-based PC running the custom-coded locomotion management application, frees locomotive managers from the confines of the dispatch center, making it possible for trains to be managed from anywhere a workstation can be attached to the host. This improves both the flexibility and the reliability of the operation.

The LMS was originally implemented as a three-tiered client/server application using Macintosh clients and MicroVAX servers running Sybase SQL. "With continuous real-time updating of this information and many people accessing and updating it, we had a nightmare," says Munley. "I was a bit worried about the presentation migrating from a Macintosh to OS/2, but we're really pleased with the way it has come out. Since it's two-tiered instead of three-tiered, the response time and interactivity are better also."

### Yardmaster

A train yard consists of three major areas: the arrival yard, the classification yard, and the departure yard. Trains are routed off the main track into the arrival yard. The yardmaster must determine the contents and destination of each car in the train, and break the train into groups of cars while moving them through the classification yard. He or she then coordinates the reassembly of the cars into trains in the departure yard, from which they ultimately rejoin the main line.

A yardmaster thus organizes the movement of resources though the yard, but also manages the personnel and resources and is responsible for all deliverables and the safety of the yard.



## FEATURE

A high-stress job? You bet. Historically, the yardmaster has relied on what could be seen from the yardmaster's tower, on stacks of reports, notes, schedules, and spreadsheets, and on real-time reports from the data center to make decisions on yard operations.

The Yardmaster workstation has made the yardmaster far more efficient. The Yardmaster screens provide graphical representations of the yard, with each car color-coded according to its contents, condition, and destination. With these views, the yardmaster can quickly determine what decisions need to be made to move inventory through the yard, rather than interpreting a lot of data first. These decisions are bottom-line critical, because they affect the ability of CSX to transport goods effectively and meet the deadlines called for by the contracts.

Bob Hammel of CSX Technology operations development says OS/2 is the right technology for this type of job. "We have four sessions communicating data to each Yardmaster workstation. We have to get all the information about cars and the data that goes with it and present it to the yardmaster immediately, so he can use it to run the yard.

"It's common to find over 20 processes running as data is being gathered, presented, and used for a multitude of tasks. With OS/2's multitasking we're able to repaint multiple views of the cars and tracks while the data is being continuously updated and used. Without OS/2's multitasking, you would find yourself blocked all the time."

### All Aboard!

The Yardmaster implementation helps to illustrate CSX's philosophy about GUIs. "It's not about GUIs," says Hammel. "The idea is to provide information at a glance, and to provide the ability to focus in on details as needed. Our users need information that allows them to quickly make the decisions needed to get the job done. The optical depiction of the yard is very important, because the yardmaster no longer always has the yard in front of him—it's sort of a virtual yard concept."

Munley sums it up: "With the graphical representation we use visual cues to enable the user to instantly comprehend what's going on. This does not require iconical representations—we're just turning data into information."

CSX Technology is currently deploying these applications and

more. In their experiences with OS/2, the railroad system's technologists have made significant gains in reducing costs and increasing productivity. And, in passing, they've demonstrated the suitability and flexibility of OS/2 for both mission-critical and support systems.

CSX's decision to use a client/host rather than a client/server architecture illustrates today's business approach to information systems design—making the systems fit the business, rather than reengineering the business to suit the latest technology available.



Photo: Bill Meyer, in technology applications, works at a Crew Management workstation.

The decision to go with OS/2 also made good business sense because of IBM's commitment to support their customers and provide them with a smooth migration path to the future. Sekely asserts, "OS/2 will work on Intel and RISC processors, and will ultimately converge with Taligent, whatever it turns out to be. In choosing OS/2, our investment in information technology will be preserved no matter what the future holds."

In a day and age in which corporate decisions are influenced more and more by mass marketing techniques and the media, it is refreshing to find a company that has found its own truth and lives by it successfully. Says Sekely, "So many industrial and political pressures drive poor decision-making. The problem for the businesses is that all this pressure, hype, and glitz adds enormous drag and inefficiencies. Too many businesses fall into the trap of duplicating things, rather than consolidating and managing them." ♦





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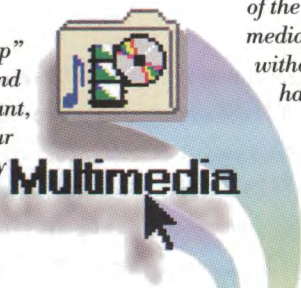
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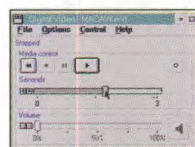
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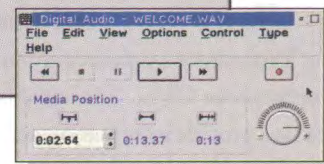
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## EYE ON THE MARKET

# GUI to the Max

DeskMan/2 and SkyScraper are two new products that enhance the administratibility and usability of your OS/2 system.

BY MICHAEL S. KOGAN

**P**owerful though the Workplace Shell is, it does not do everything required by system administrators managing distributed client/server environments.

Administrators need tools that enable them to support large numbers of WPS users with a minimum of effort. What does *support* mean? It means being able to create and deploy standard and personalized desktops throughout the business, back up and restore client desktops, and allow users to get the most out of their systems while preserving the ability to maintain and support them.

These are all functions the WPS should provide, but doesn't yet. Two companies, Development Technologies and Binar Graphics, have recognized the need for tools to supplement OS/2's functionality in these areas, and have delivered DeskMan/2 and SkyScraper, two excellent tools that enhance the administratibility and usability of the system.



### Administering the Desktop

DeskMan/2 from DevTech was originally conceived as a backup/restore utility for WPS desktops, but the latest version, 1.5, incorporates numerous special functions and extensions to the Workplace Shell object environment. After a very simple installation process, DeskMan/2 appears as a single icon on the WPS desktop. Because DeskMan/2 comes with CID support, it is very simple to install it across clients in the enterprise.

Through the DeskMan/2 icon or included command files, users and administrators can access the basic backup/restore functions. To prepare a standard desktop for distribution, an admin-

istrator need only create it, back it up, and use scripts included with DeskMan/2 to distribute it across the enterprise. The backup data can be saved in either an ASCII text format or a binary compressed format using the DM2Image utility included with DeskMan/2.

Backup and restoration of desktops will allow administrators and users to sleep better at night, but this is only the tip of the iceberg. DeskMan/2 also supports a variety of special functions including the ability to delete any object (even those the shredder won't let you delete), query and set object styles, associate any icon in the system with any object, and restrict user access to object actions (for example, delete, move, copy, shadow, drag, or settings) by modifying object styles.

Using these functions, an administrator can first become more familiar with the use of objects by the WPS, and then create a standard desktop or folder whose objects cannot be altered by users. This is a huge benefit when it comes to supporting and maintaining a large number of desktops and providing a look-and-feel that is consistent across the enterprise.

Have you ever traversed through several layers of folders to access a program or object and found your desktop cluttered with the folders you opened to get to your target? If you have, you'll find DeskMan/2's Workplace Shell extensions useful. The extensions are configured by accessing the system icon in the system setup folder, just like any other configuration parameter. In this case, the minimize-on-use and extensions to the WPS open and close object styles will allow you to define a wide variety of behav-



## EYE ON THE MARKET

iors that will keep your desktop clean, such as closing, hiding, or minimizing the parent folder when a folder is opened.

The WPS extensions also support a number of ways to restrict and control access to the desktop, including object password protection. Not only can the shutdown, lockup, and system setup be removed from the user, but all object and shadow creation can also be disabled. The WPS extensions are flexible and powerful enough to assist administrators and users in a wide variety of environments with differing requirements.

### DeskMan/2

Version 1.5  
DevTech  
308 Springfield Road  
Forest Acres, SC  
29206-2113  
(803) 790-9230  
fax (803) 738-0218

**LIST PRICE:**  
\$79.95

### When one is not Enough

While DeskMan/2 addresses the requirements of desktop administration and maintainability, another type of utility that allows users to access and get the most out of their GUI is the virtual desktop manager.

er. Virtual desktop managers reduce desktop clutter and increase desktop real estate by giving the user multiple desktops.

Binair Graphics' SkyScraper and the VUEMan/2 tool that comes with DeskMan/2 are both virtual desktop managers. Virtual or logical desktops reduce desktop clutter and make it easier to get work done: instead of minimizing windows, users can keep each program or group of programs maximized on its own virtual desktop. Both products present the user with a control, typically located at the bottom of the screen, that depicts in miniature and provides access to all of the logical desktops.

SkyScraper and VUEMan/2 both support either multiple desktops or one monster desktop with real estate beyond the boundaries of the physical screen. They both also support the saving and restoring of multiple virtual desktop configurations and "sticky" windows that are common across all desktops.

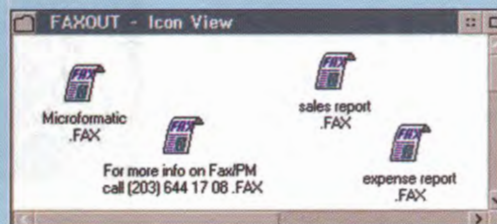
The SkyScraper product is more mature than VUEMan/2. SkyScraper has a sexier desktop control with a slick tool bar and superb drag/drop integration. It supports mouse and keyboard

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## EYE ON THE MARKET

panning across multiple desktops, and provides easy control-button access to full-screen DOS and OS/2 sessions. Perhaps the best feature of SkyScraper is its integrated program launcher, which allows the user to start commonly used programs with a single click without having to open any folders.

While VUEMan/2 is not as polished, it does perform the basic multiple desktop management functions well. It also provides a unique password-based window protection scheme that supplements the object protection of DeskMan/2 and its WPS extensions.

### SkyScraper

Binar Graphics  
30 Mitchell Boulevard  
San Rafael, CA  
94903-2034  
(800) 228-0666

**LIST PRICE:**  
\$99.95

Regardless of whether you prefer SkyScraper or VUEMan/2, they both are great utilities for making the OS/2 desktop more usable. What I'd really like to see in the future is the ability to minimize windows directly to whatever virtual desktop manager is running, and an

open architecture that makes integration of virtual desktop managers easier.

### Getting Productive

Both DeskMan/2 and SkyScraper dramatically improve the ability of corporations and users to get the most out of OS/2. DeskMan/2 helps administrators restrict and control what users are doing, provides robust backup/restore features, and seamlessly enhances the features of the WPS. Both SkyScraper and VUEMan/2 give users better ease of use, make navigating the GUI much easier, and keep the desktop clean.

That both DeskMan/2 and SkyScraper enhance the WPS environment without having to wait for a new release of OS/2, can be attributed to the extendibility and robustness of the SOM-based WPS architecture. Although some of the features provided by DeskMan/2 and SkyScraper will find their way into future versions of OS/2, user requirements ensure there will always be a GUI-enhancer/extender after-market. ♦

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DOT EXE

Software for OS/2

# R:BASE 4.5 for DOS and OS/2

If you need a low-frills industrial-strength standalone program, here's a candidate worth considering.

BY HERB TYSON

**R**:BASE 4.5 is a flexible, fast, cross-platform character mode database. The package contains three versions: 16-bit DOS, 32-bit DOS, and 32-bit OS/2. All three are 100 percent file- and command-compatible. If you want a low-frills, fast, multi-user, character mode relational database program whose DOS and OS/2 incarnations are identical, R:BASE might just be the ticket. If you're waiting for a whiz-bang GUI, Workplace Shell-enabled, state-of-the-art database program for OS/2, though, R:BASE isn't your stop.

One caveat: by the time this review sees print, Microrim should be shipping R:BASE 4.5 Plus. Microrim provided beta copies of the new version, but it is our policy not to review beta code.

## Installation

Almost everything about R:BASE is no-nonsense, including the installation program. Just type A:INSTALL, and all 7mb—contained in just three 1.44mb diskettes—is installed in less than 10 minutes. The choices are few and the options are mostly straightforward. Like most well-behaved OS/2 installation programs, R:BASE allows you to switch to another application while the installation program copies the files to your hard disk.

Unlike some intrusive setup programs, R:BASE's installation doesn't touch your CONFIG.SYS file. For many OS/2 users, that's a plus. However, you will want—make that *need*—to add the R:BASE directory to your path if you plan to use R:BASE on more than just the current directory. That's because R:BASE suffers from amnesia when looking for its message files, help file, and

modularized executable files if you change directories.

The installation routine doesn't explain this feature very clearly, and the result can be some disconcerting error messages such as *The HELP file is not available*. Once you add the R:BASE directory to the path and reboot OS/2, however, all is well.

## Ease of Learning and Use

R:BASE is straightforward and easy to learn, albeit a little user-unfriendly at times. It often makes you retype entries completely rather than edit what you already typed. The layout of the

menu is very logical, and proceeds from left to right as it prompts for more data. When creating a database, for example, R:BASE presents each of the options in order, as if leading you by the hand.

Creating a new database turns out to be pretty easy once you understand the underlying rules. For example, R:BASE doesn't accept long HPFS file names. Database file names must conform to DOS file naming conventions. Once you're working

in the database, you may use up to 18 characters for table and variable names, but you can't use embedded spaces. So if you want to have a table called *Chicken Soup*, you can call it **ChickenSoup** or the ever-aggravating **Chicken\_Soup**.

If you mistype or type an illegal character, however, R:BASE isn't terribly forgiving. It beeps, tells you **-ERROR- Illegal table name - Chicken**, and then returns you to the menu. Far better would be an option to let you edit the errant text.

When you tell R:BASE to create a new database through the



Figure 1. R:BASE leads the user through a logical set of prompts to specify the structure of the database tables.



menu, its menu command structure deposits you at the next logical task each time you successfully navigate the preceding level. To create a new database, for example, you select **Create/Modify** from the Database menu. This puts you into the **Create** menu if a database isn't already active. There, you're prompted to type the name (the aforementioned eight-character file name) that will subsequently identify the database in the main menu.

Next, R:BASE prompts you to name and create a table. Note that a single database may include several tables (the table names, unseen by the underlying file system, need not conform to the 8.3 naming convention). R:BASE then leads you through prompts that specify the structure of the table—the variable names and data types, as shown in Figure 1. It's all very logical, albeit regimented and unforgiving at times.

R:BASE features three modes of working: Menu, Prompt By Example (PBE), and the R> prompt. If you're an occasional or infrequent user, the Menu is the way to go. The names of commands in the menus are logical, common-sense names that aren't necessarily related to R:BASE's command language. If you need to develop a knowledge of R:BASE, particularly if you will be

writing or editing procedures using its powerful programming and procedures language, you should skip the menu and go directly to PBE. PBE, shown in Figure 2, is also a menu system, but it's based on R:BASE's command names, rather than the English-style menus. From PBE, it's easy to graduate to the plain R> prompt.

Like dBASE and Paradox, R:BASE provides a development environment for creating easy-to-use data entry and ordering systems. The resulting systems may then be used by people who aren't familiar with the underlying R:BASE program. In fact, if you walk into retail establishments, you'll discover many of them using R:BASE (although the personnel typically don't know it).

In addition to data entry forms, R:BASE can automatically generate entire applications through Application EXPRESS, a

menu-building tool. You can create pop-up, pull-down, vertical, or horizontal menu setups, associating any R:BASE procedures where necessary. The building process is entirely menu-driven, and once done, R:BASE writes the appropriate programming steps to a file. You can quickly and easily generate an application for tasks such as entering data, conducting a telephone survey, creating an inventory system, or setting up a point of sale system.

## The Up Side

R:BASE has much to recommend it as an industrial-strength standalone database program. It works identically under OS/2 or DOS, works well in a networked environment, and allows multiple user access to the files. In addition to the 32-bit DOS and OS/2 versions, you have available a 16-bit 80286-based DOS version as well.

Performance was a bit of a mixed bag. The DOS version (running in a DOS window) did not seem to respond quite as quickly as the OS/2 version, and the OS/2 version definitely loaded faster. But query and view operations (the heart of most data tasks) turned in nearly identical performance under both environments.

More to the point is performance compared to similar database products such as Paradox for DOS. When joining the complete contents of one smaller table to another larger table, Paradox for DOS could report the result and scan through the table more quickly than R:BASE (48.6 seconds versus 1:04 for R:BASE). What quickly became apparent, however, was that R:BASE uses its relational capabilities to begin reporting results earlier (within a second or two). When the scope of the join was narrowed to a handful of records, such as events on a specified date range, R:BASE had the upper hand (2.5 seconds versus 3.7 for Paradox).

Unlike many OS/2 programs, R:BASE doesn't require the Presentation Manager APIs and printer support. Should you prefer, an R:BASE server can commit an entire OS/2 or DOS system to running just R:BASE. Since OS/2's Workplace Shell can



Figure 2. When creating a database under the Prompt By Example working mode, the user relies on R:BASE's command names rather than on English-style menus.



add more than 4mb of memory overhead, running R:BASE without WPS could be a big plus for industrial users.

### The Down Side

R:BASE is not without its faults, and it's not necessarily the best database system for every user. Its character-mode interface, for example, will not sit well with some users, particularly those who need a database program that integrates well with GUI applications.

Likewise, by shunning integration with OS/2's system printing functions, R:BASE can't take advantage of OS/2's Adobe Type Manager to give your reports the look you want. You're limited to the fonts installed in your printer. Industrial users might not mind a report that uses Courier or Line Printer fonts. For published reports, however, you'll need to export from R:BASE into a word processor or spreadsheet program to get better results.

As a character mode application, R:BASE also lacks DDE (dynamic data exchange) facilities for inter-application data transfers. While you can design procedures to quickly export data to a variety of formats, resorting to such a manual process seems a bit old-fashioned and circuitous compared to DDE and OLE. Likewise, you won't find built-in clipboard services. You can run R:BASE in a window and use OS/2's own VIO (virtual input output) window clipboard facilities. However, the results are less than optimal, and certainly aren't as fluid as they would be in a GUI application.

A bigger loss, while not necessarily related to its character mode interface, is the clumsy method used to change drives and direc-

tories. The selections aren't integrated within the file menus, but instead are separate items. Point-and-shoot selection will list only R:BASE files. To import other types of files—ASCII, Lotus, dBASE, pfs:FILE, DIF, and Multiplan—you must type in the name. You can use the VIO clipboard to help, but it's still more

#### R:BASE 4.5 for DOS and OS/2

Microrim  
15395 S.E. 30th Place  
Bellevue, WA 98007  
(800) 628-6990  
(206) 649-9500  
fax (206) 649-2792

**LIST PRICE:**  
\$795

tedious than it needs to be.

Another difficult-to-understand deficiency is the lack of support for enhanced HPFS file names. If you create a spreadsheet with a long file name using 1-2-3 or Excel for OS/2, R:BASE

will not display the entire name, nor will it accept it as input. Instead, you must rename the file to conform to the limited 8.3 FAT format. This has nothing whatsoever to do with support for PM, and, we've been told, isn't really all that difficult to provide.

R:BASE comes with a DOS-based tutorial. It's good, but it has an irksome feature: the opening screen is graphics-based. It's an odd feature in an otherwise text-based program. The exasperating result (if you run OS/2 SVGA resolution) is a message from OS/2 informing you that the tutorial will not run in a window. Once the gratuitous graphics logo screen goes away, however, you can press Alt+Home to return to windowed mode.

### Documentation

The documentation that comes with R:BASE is generally good, although the three manuals are a bit difficult to navigate. For example, among the query mode's operators are two called CONTAINS and LIKE. When I used the manuals' indexes to determine what LIKE means, I hit a brick wall. Ultimately, I did discover (to my disappointment) that LIKE is essentially the same as =. Eventually I found the information in the HELP system, but I was unable to find it in the manuals. It was similarly difficult to discover other items as well. To become an expert with R:BASE, you may very well need to read each of the three manuals cover-to-cover.

### The Bottom Line

If you need an industrial-strength database program for your OS/2 systems on par with applications such as dBASE or Paradox for DOS, R:BASE can handle the job. The GUI alternatives in this user-class database environment are Windows-based: programs such as Paradox for Windows or Microsoft Access. However, if you're looking for a fully OS/2-aware and WPS-aware GUI database program that will serve well as an integrated office database program, don't hold your breath. ♦

*Herb Tyson, a computer industry analyst and consultant, is the author of several books, including Your OS/2 2.1 Consultant, 10 Minute Guide to OS/2 2.1, and the Word for Windows 6 Super Book.*



# Screen Capture Rapture

Eight ways to take a snapshot of your OS/2 screen.

BY RICH MALLOY

I could not find one anywhere. I downloaded a huge list of OS/2 apps compiled by IBM. No luck. But thanks to the staff at *OS/2 Professional* and the folks in the magazine's conference on BIX, I eventually found the solution—in fact, a list of eight solutions! I now had a case of screen capture rapture.

The object of my search was a simple utility that could take a snapshot of an OS/2 screen and save it in a form usable by other programs. Such an item is indispensable for anyone who writes about software in this age of the GUI.

Naturally, software reviewers and manual writers who want to illustrate their prose would be the primary users of such a product. But another important user target is the corporate employee. How often have you had to teach a new employee or a temp how to use a system? Wouldn't it be easier to illustrate your list of instructions with actual images of the various menus and dialog boxes that will confront your new users?

Microsoft's Windows has an under-publicized feature that attempts to handle this. If you want to capture a screen image, just press Alt-PrintScreen. An image containing most of the screen is captured to the Clipboard. You can then paste the image into a word processor document or load a program such as Windows Paintbrush through which you can crop and save the image in a file format usable by other programs. The feature is also available in WIN-OS2 sessions.

Native OS/2, by contrast, does not have this feature. The resulting vacuum of sorts was quickly filled by a number of people. I came across no less than four commercial and four shareware programs that address this need.

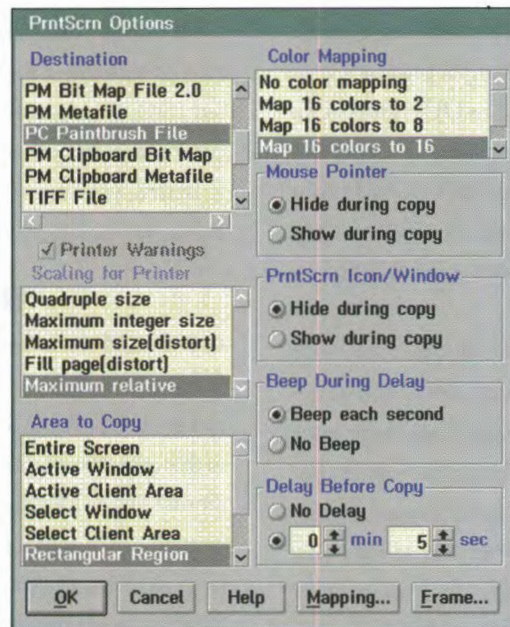
What do you look for in a screen capture program? Basically, you want a product that can capture what you choose and save it in the format you need. Often you may need to capture the whole screen, which all of the programs listed below can handle. But

usually you need to focus in on one window or dialog box.

Capturing the image from a crowded desktop can sometimes be a bit tricky. To keep distracting "screen noise"—the capture utility's own window, for example, or other desktop icons—at a minimum, most programs run in background with the image snapshot triggered through a hot key. Others give you a timing mechanism like you might find on a camera: trip the timer and then arrange the windows on your screen before the snapshot is taken.

After you capture the image, you will typically export it to a file format readable by another program

such as a word processor or paint application. You will find a plethora of supported formats. The PCX format popularized by ZSoft's PC Paintbrush has become a standard for bitmap image transfers. The BMP bitmap format used by OS/2 and Windows is recognized by many application programs. Also useful are the Windows Metafile (WMF) and OS/2 Metafile (MET) formats.



This dialog box from Mitnor Software's screen capture program shows some of the options the program offers.



## DOT EXE

Then there are a number of special purpose formats including TIFF, PostScript, WordPerfect (WPG), and CompuServe (GIF).

### Commercial Offerings

The four retail screen capture programs are, naturally enough, better supported than their shareware cousins. Their extra cost is offset by a printed manual and extra features, such as the ability to manipulate images after they have been captured.

Collage PM, from Inner Media, Inc., consists of two programs: Collage, for capturing images, and Show, a DOS program that displays a sequence of image files. Collage has a timer with a nice audible countdown, but no hot key to trigger a screen capture. Once the image is captured, you can preview it, flip it horizontally or vertically, reverse the colors, or crop it before filing it away in one of several file formats (PCX, TIFF, BMP, MET). To use just a portion of a screen, you must first capture the whole screen and then crop it. Fortunately, there is a mechanism to crop everything but the active window. With a retail price of \$199, Collage PM is the most expensive of the products examined.

Open Shutter, from One UP Corp., is a useful program with a number of interesting and unique features. It offers the widest array of file formats (14, including MacPaint!) and lets you stretch, compress, or even rotate a captured image. The program is especially useful for working with icons and pointers. It supports icon file formats for both Windows and OS/2 and has a 32-by-32-pixel magnifier that seems perfect for working with icon-sized images. Plus, the program lets you specify the icon's "hot spot." Open Shutter has a suggested list price of \$69.95.

Print Utility/2 v. 1.1, from Taylor Made Systems, is designed for software developers. It consists of three programs: PrtScr, for capturing images to a file, PSShow, for displaying images

in sequence, and File Lister/2, for printing and viewing text files. PrtScr sports a reasonable set of file formats (PCX, GIF, WPG, and both flavors of BMP), but using Microsoft Windows Paintbrush I had trouble reading a PCX file it created.

The most interesting part of Print Utility/2 is the File Lister/2 program. This program can display and print ASCII text files such as program files squeezed down to four pages per page. On a laser printer, the type is minuscule but readable. For huge program files, this program could save massive amounts of paper. At \$59.95, Print Utility/2 is the lowest priced retail product in the group.

PrntScrn v. 2.0.1, from Mitnor Software, has the most capabilities of any product tested. It can store images in 10 formats (including PCX, GIF, two different types of OS/2 BMP formats, and three flavors of TIFF). The only major format missing is PostScript. Once captured, either by hot key or timer, the colors of the image can be changed through a nice color-remapping feature.

PrntScrn provides an extensive array of screen area selection options. For those who need it, there is also a date and time display and a screen blanker that can totally blank out the screen—a required feature for some power-conserving monitors. PrntScrn carries a list price of \$115.

### Shareware Programs

Shareware programs can take on a life of their own, in some cases floating around BBS systems long after their developers have moved on to other interests. With such an informal distribution system, it is difficult to be sure you have the latest or best version of a program. So with that proviso, I present here the four screen-capture programs I found on BIX in the IBM.OS2 area of the Listings section.

Clip v. 1.1B from a Canadian company called

### RETAIL

#### **COLLAGE PM**

Version 1.01  
Inner Media, Inc.  
60 Plain Road  
Hollis, NH 03049  
(603) 465-3216  
fax: (603) 465-7195  
List price: \$199

#### **OPEN SHUTTER**

Version 1.11  
One UP Corporation  
1603 LBJ Freeway  
Suite 200  
Dallas, TX 75234  
(800) 678-01UP  
fax: (214) 620-9626  
List price: \$69.95

#### **PRINT UTILITY/2 VERSION 1.1**

Taylor Made Systems  
PO Box 180096  
Mobile, AL 36618  
(205) 344-0672  
fax: (205) 460-9001  
List price: \$59

#### **PRNTSCRN**

Version 2.01  
Mitnor Software  
28411 E. 55th Street  
Broken Arrow, OK 74014  
(918) 357-1628  
fax: (918) 357-2869  
List price: \$115

### SHAREWARE

#### **CLIP**

Version 1.1B  
Dynamlink Technologies, Inc.  
Filename: CLIP11B.ZIP  
Price: \$20

#### **NIKON II**

Version 1.0  
Bitware, Software & Services  
PO Box 3097  
Manuka, A.C.T. 2603  
Australia  
CompuServe: 100033,340  
Filename: NIKON2.LZH  
Price: \$49

#### **PM CAMERA/2**

Version 2.10  
IBM  
Filename: PMCAM2.ZIP  
Price: Free

#### **PMCAP**

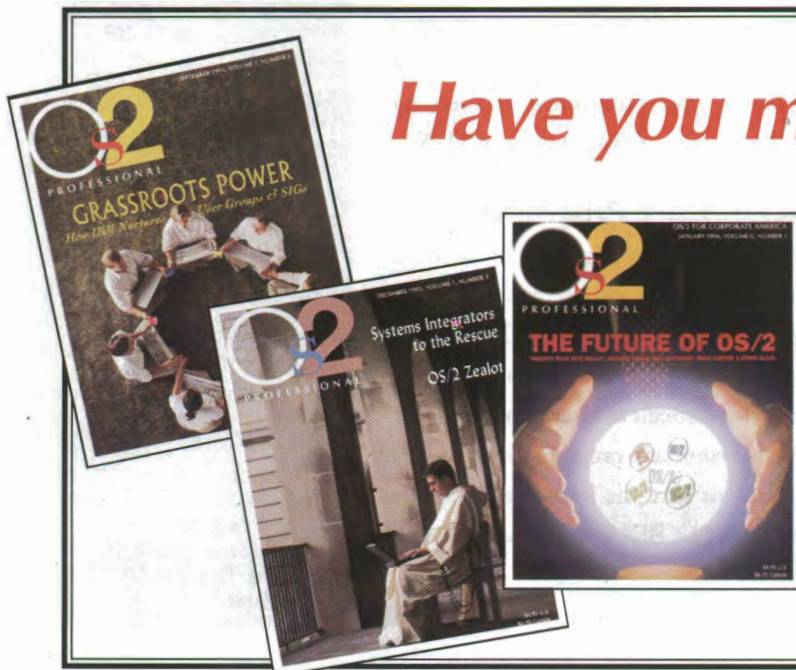
Version 1.31  
Charles Petzold  
CompuServe: 72241,56  
Filename: PMCAP.ARC  
Price: Free



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## DOT EXE

Dynalink Technologies, Inc., is an oldster, with a copyright date of 1990. The program says it can save files in several formats, including PCX, TIFF, PostScript, and OS/2 BMP and MET. I had trouble, however, with the PCX (using Windows Paintbrush) and TIFF (using CorelDRAW) formats. The program's author asks you to pay \$20 if you use the program in your work.

Nikon II, from an Australian company called Bitware, Soft-

ware, & Services, can save in only one format, BMP. The author of the program offers it free for 21 days. After that he requests \$65 Australian (about \$49 US).

PMCAP v. 1.31 was written by *PC Magazine's* genius-in-residence, Charles Petzold. It is the oldest of the programs, written back in 1989, but it still works. It uses a timer to capture the whole screen. PMCAP supports PCX, BMP, and PostScript

### WHAT THEY CAN DO

	<b>Clip v. 1.1B</b>	<b>Collage PM v. 1.01</b>	<b>Nikon II v. 1.0</b>	<b>Open Shutter v. 1.11</b>	<b>PMCAP v. 1.31</b>	<b>PM Camera/2 v. 2.10</b>	<b>Print Utility/2 v. 1.1</b>	<b>PrntScrn v. 2.01</b>
<b>Distribution</b>	<b>Share</b>	<b>Retail</b>	<b>Share</b>	<b>Retail</b>	<b>Share</b>	<b>Share</b>	<b>Retail</b>	<b>Retail</b>
<b>Capture Capabilities:</b>								
<b>Whole Screen</b>	y	y	y	y	y	y	y	y
<b>Window</b>	y	y	y	y	n	y	n	y
<b>Portion of Screen</b>	y	have to crop	y	y	n	y	y	y
<b>Capture Trigger:</b>								
<b>Via Hot Key</b>	n	n	n	y	n	y	y	y
<b>Via Timer</b>	n	y	y	n	y	n	n	y
<b>Image Manipulation</b>	color to b/w	flip H/V, reverse colors	—	flip, rotate, stretch	color to b/w	—	—	color mapping
<b>Preview</b>	y	y	n	y	y	n	via PSShow	y
<b>File Formats:</b>								
<b>PCX</b>	p*	y	y	y	p	n	p	y
<b>Windows WMF</b>	n	n	n	y	n	n	n	n
<b>Windows BMP</b>	n	n	y	y	n	n	y	y
<b>OS/2 MET</b>	y	y	n	y	n	n	n	y
<b>OS/2 BMP</b>	y	y	y	y	y	y	y	y
<b>TIFF</b>	p	y	y	y	n	n	n	y
<b>PostScript</b>	y	n	n	y	y	y	n	y
<b>Clipboard</b>	y	y	y	y	n	y	y	y
<b>Other Formats</b>	—	—	—	GIF, ICO, MacPaint	—	PSEG	GIF, WPG	GIF, WPG
<b>Other Features</b>	—	—	—	can put hot spot in icons	—	—	includes file lister utility	date/time, screen blanker

\*p Problem reading file format



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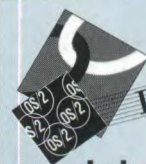
## DOT EXE

formats, but I couldn't read the PCX format. The author offers PMCAP for free.

PM Camera/2 v. 2.10 is a freeware program from IBM that was written by Jürg von Känel. The program supports only a small number of file formats (BMP, a mainframe format, and two Post-Script formats). But the price is great: it's free.

Of all the programs, PrntScrn had what seemed to be the largest and most useful set of features. Right behind PrntScrn was Open Shutter. All the shareware programs seemed to do the job adequately. But with the backing of IBM behind it and a price of \$0, it's hard to beat PM Camera/2.

In an ideal world, screen capture would be an inherent part of an operating system. And it may in fact be so some day. But until then, these programs will be invaluable on those occasions when you need to capture the screen. ♦



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Circle #29





# **Pop goes the Upgrade**

Before you drop in that new CPU chip, keep in mind that there's more to performance than speed.

BY WAYNE RASH JR.

**F**eeling a little sluggish? Unhappy because your copy of OS/2 is running a little more slowly than the one on the snazzy new PC in the next office? Tired of going out for lunch while waiting for your database server to deliver a response? Wouldn't it be nice if you could simply pop in a new CPU chip and make the problem go away? Well, maybe you can.

Up until recently, upgrading a desktop computer meant that you had to order a new one. Intel 80386 processors and 80486 processors were simply too different from each other to work on a common motherboard. While you could always buy a new motherboard if you wanted a better computer, that's a job many users would prefer not to tackle, and one that will be low on the tech support priority list. Unfortunately, buying a new computer isn't always in the cards—or, more to the point, in the budget.

Recently, though, things have changed. First, computer manufacturers started delivering systems that had small dedicated circuit boards for the processor that could be replaced by simply unplugging one processor's card and plugging in another. The Z-Server mentioned in the December issue [Connectivity] is such a system. Unfortunately, that tends to be an expensive option, since the upgrade boards come from a manufacturer who would otherwise be selling you a complete system.

Finally, Intel Corporation developed a version of its DX/2 processors that would work in a computer with a standard 80486 processor. You might, for example, replace a 25mhz 486 and immediately be able to bump the speed up to 50mhz. Unfortunately, this worked only with 80486 processors.

Now, Cyrix Corporation of Richardson, Texas, has introduced a version of its clone of the 80486 that can be plugged into a stan-

dard 80386 socket. In the process, the new Cyrix product doubles the CPU speed. This means that you might replace your old 386/33 with a chip that would convert the PC into a 486/66. Sounds too good to be true?

In this case, it's true. Still, that doesn't mean that such an upgrade is necessarily a good idea, or even if it's a good idea, that it's right for all applications.

## **The Upgrade Decision**

How do you decide whether it's worth the trouble or expense to replace the CPU in your network's file servers or application servers? Like everything else in computing, it depends on what they do. If you're running a network file server that's primarily performing file and print services, for example, it might not make a lot of sense.

"It's rare for file servers to be CPU-bound," explains Patrick B. Farrell, a senior principal at American Management Systems, Inc. in Arlington, Virginia. Farrell says that a faster processor really won't help many file servers if their processors aren't working very hard anyway. "It might make more sense to replace their network interface card or add more memory."

Farrell notes that network servers frequently require large amounts of memory; when they don't have all they need, they often make heavier use of their hard disks, which can slow things down. Likewise, a slow network card can be a significant bottleneck.

Network application servers, whether they're sharing a platform with a network operating system or not, are a prime target for upgrades, since the speed of the platform on which they reside directly affects the speed at which they operate, and that in turn



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## CONNECTIVITY

affects the performance that network users see. By replacing the CPU chip with one that's faster, performance can be improved.

Performance speed depends on many things, however, of which the speed of the processor is only one. Many older systems may be hobbled by slow disk drives, inefficient designs, or limited memory that might make buying a new motherboard or even a new computer a good idea.

### The Upgrade Process

On the other hand, many users bought 386-based computers recently, not realizing that operating system changes, connectivity requirements, and huge data file requirements would evolve as quickly as they did, leaving them stranded in the slow lane.

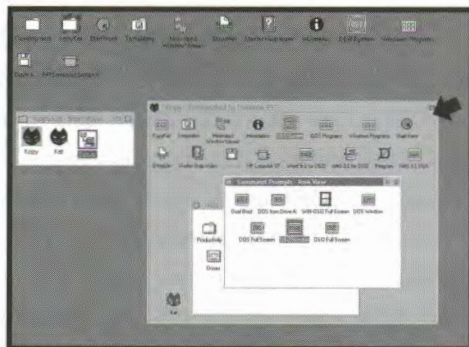
Depending on the computer you plan to upgrade, the process can range from extremely simple to impossible. While both Intel and Cyrix require only that you replace the CPU chip, such a replacement may not work, and in some cases, gaining access to the processor so that it can be removed for replacement can be a difficult task.

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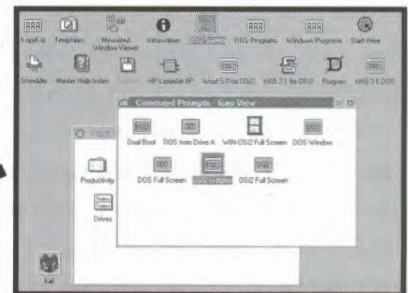
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The Cyrix and Intel upgrades work much the same way. You'll need to order a processor that matches the type of system you're upgrading. Check the existing processor and the processor's speed when you do this. If you're upgrading a system using an 80386, you'll need the Cyrix processor. An 80486 system needs the Intel Overdrive. The clock speed of your existing processor is expressed in megahertz, so you'll see terms like 386/33 or 486/25 on the computers you're upgrading.

The Cyrix upgrade for 386 and 386SX computers includes both an 80486 processor and a speed-doubler circuit, so your 386/33 computer will become a 486/66. Because the 386 doesn't include any provision for an onboard memory cache, the computer itself doesn't know how to enable this feature. For this reason, Cyrix includes software that switches on the cache.

Software for OS/2 is included, but if you're upgrading your NetWare file server, you'll need to download the NetWare cache enabler from Cyrix's bulletin board. The software only turns the cache on, so it's not a TSR, and it doesn't stay resident in OS/2. As a result, once it's run, it no longer requires any system memory.

The Intel Overdrive Processor is even easier to install. It simply replaces the 80486DX processor already in your system with one that runs twice as fast. A few early 80486-based computers won't work with this processor, but nearly everything does. Intel's customer support keeps a list, and once you install the processor, there's a diagnostic package that checks to make sure all is well.

We tried a Cyrix Cx486DRx-20/40 processor in a Novell 386AE file server that runs NetWare 3.12 and supports several OS/2 workstations, and supports OS/2 Name Space. This machine's response time had been slowing due to computing demands placed on its 16mhz processor. We used the 20/40 version of the chip because the 16mhz version was being discontinued, and Cyrix assured us it would work fine. It did, and benchmarks on the server showed a five-fold increase in speed. Response time improved in real-world use, as well.

The next machine we tried was a Unisys 486/25 computer running OS/2. In the past, this machine's performance had shown that it wasn't well suited to running OS/2. We installed the Intel Overdrive 80486 processor in place of the existing processor.

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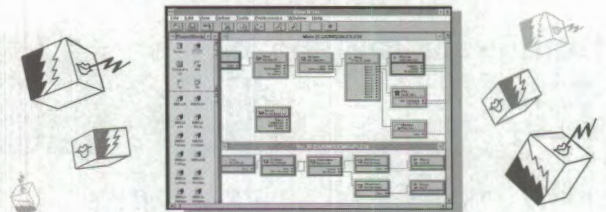
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Note that some systems have an Overdrive socket already installed, so you can install the upgrade without removing the old processor.

Both companies provide complete instructions and chip removal tools. The actual removal involves using the L-shaped removal tool to pry the processor loose. Inserting the new processor involves carefully lining up the pins on the new processor with the holes in the mounting socket, and pressing the processor down firmly with your thumb. Once you've done that, Cyrix gives you a glitzy green heat sink to stick to the top of their chip. Intel doesn't.

### But is it a Good Idea?

There's no question that you can upgrade an 80386 or 80486 processor using one of these upgrade chips. That doesn't answer the question of whether it's a good idea, however. On this, there are a couple of ways to look at it. "It protects your existing investment," says Mark E. Vermette, director of integration of the Commercial Systems Group for Universal Systems, Inc. in Fairfax, Virginia.

Corby A. Cox, MIS director for the City of Fairfax, Virginia, agrees; "It might extend the useful life of a piece of equipment a year or two." Cox says that the ability to upgrade using only a single chip creates the opportunity to perform field upgrades that are both cost-effective and easy to perform. He notes, however, that while it might be a worthwhile effort, just upgrading the processor on a file or application server may not be a complete answer. "Hard disk speed is usually the biggest factor," in server performance, Cox says.

Vermette says that OS/2-based systems are more likely to benefit from a processor upgrade than is NetWare. He also thinks that there are several other priority items that should be checked when contemplating a processor upgrade. He says the three highest priority items are the processor, the disk access, and the LAN access, and that all three of them need to be working fast enough if the server is to meet the needs of its users.

### Should you Upgrade?

So upgrades work, and they might be a good idea. How do you know if they're for you? You have to decide whether having a faster processor in your file or application server will help anything. Here's how you tell:

1. Check to see how busy the existing processor is. Your network operating system will include a utility that will tell you how

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## CONNECTIVITY

busy your file server is. If it shows frequent periods of heavy utilization, that's a good indication that the processor is working overtime and could benefit from an upgrade.

2. An application server that's slow to respond to queries or takes a long time to process data may be another candidate, but check the disk drives to make sure that the real problem isn't just a slow drive or drive controller. If your disk access light is on all the time, it's a good bet that your problem is the disk subsystem.

3. Try adding an additional network interface card to the server in question. If that cures the problem, your processor is working fine, but you had a bottleneck accessing the network. If things don't improve, it could well be that the processor needs upgrading. On the other hand, you might just need more memory, and that's usually easy to check—just add a SIMM (single in-line memory module) or two to your computer's RAM, and you'll either notice an improvement or you won't. If you don't, it's a good bet that you need a faster CPU.

4. It may be that you're waiting for your workstation instead of the network. If you're doing graphics-intensive work or working with products that require a lot of processor time, such as desktop publishing or computer-aided design, you may be better off upgrading your workstation with one of these processors instead of the servers on the network.

Ultimately, you have to decide whether a processor upgrade is the right direction for your company. The products deliver on their promises, and they really do make things run faster. The problem is that there's more to performance than the speed of the processor. If it's total performance you need, then you need to look at the total system. ♦

### At a Glance:

#### Cyrix Corporation

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#### Intel Corporation

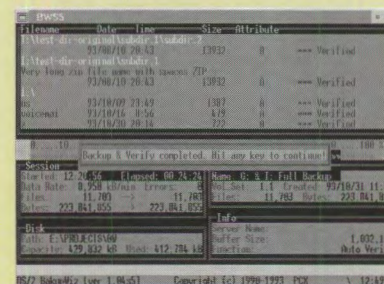
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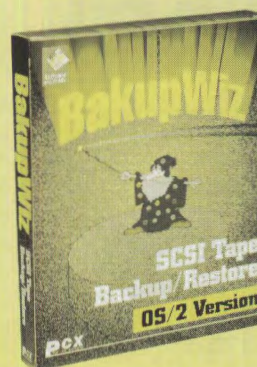


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## MARKETLINE

*Product News for the OS/2 User*

# SCOOPS

## AS/400 Shifts Hint at OS/2's Future

With a set of hardware releases this month, IBM will kick off the most sweeping changes in its midrange division since the introduction of the AS/400 in 1988. And a close look at the changes suggests the role OS/2 will play in IBM's determined attempt to cash in on its OS technology.

Anticipating the AS/400's shift from a central computing resource to a central data server, IBM will enhance the AS/400's file serving capabilities with LAN Server/400, which is scheduled to ship in September. The system operator administers LAN Server/400 through the same "green screen" formats used by other AS/400 services. However, under the covers, LAN Server/400 consists of an integrated processor card holding

a 66mhz 486 and an Intel 960 RISC processor with 16-64mb SIMM memory running OS/2 and LAN Server. Each LAN Server/400 may hold one or two network adapters (Ethernet or Token Ring) and shares the AS/400 disk.

On the development side, IBM will ship a visual version of RPG called VRPG (although relatively unknown outside IBM shops, RPG is the language of choice for S/3x and AS/400 programmers). VRPG uses an OS/2 workstation and a forthcoming release of WorkFrame 2.5 (the current release, WorkFrame 2.1, ships with IBM CSet++ for OS/2) as the development environment. The resulting visual programs can run on either an OS/2 or a Windows 3.x client connected

to the AS/400 host. SOM and DSOM (OS/2's object oriented features) will also play a central role in the AS/400 development environment.

Although no release date has yet been announced, IBM officials underscored their determination to provide operating system support in the AS/400 environment for OS/2 (in its Workplace OS guise), Unix, and Taligent. The key to this transition will be the introduction in 1995 of 64-bit PowerPC AS/400s.

The new version of the AS/400 operating system, OS/400 V3R1, will sport a new file system based on POSIX. Named the Integrated File System, it will automatically adapt itself to the client environment. For example, an OS/2 user will see long

file names with backslashes separating directories, a DOS or Windows user will see 8.3 file names, and Unix users will see slashes as path separators with case-sensitive file names. On the OS/2 desktop, AS/400 objects appear as standard network and drive folders with full drag-and-drop support.

The announcements offer an important reading on IBM's commitment to OS/2. Throughout a day and a half of press briefings, OS/2 appeared in both subtle and not-so-subtle ways. As a required development environment for next-generation products such as VRPG and an integral component of system-critical elements such as LAN Server/400, OS/2 clearly is growing into a pivotal product across IBM's lineup.

## New Products



UpdateIt! allows publishers to create a single file to update an entire directory tree.

### The latest Update

UpdateIt!, a multiplatform file utility, is now available from Innovative Data Concepts, Inc. This new product enables software developers and publishers to ship their customers compressed, password-protected change files or upgrades. Developers thus

can provide incremental product updates and bug fixes without shipping new copies of their products. UpdateIt! can create either raw change files or standalone .EXE programs.

IDC currently is shipping the product at a price of \$249; demo copies are available

upon request. Innovative Data Concepts, Inc., 122 North York Roads, Suite 5, Hatboro, PA 19040, (800) 926-4551, fax (215) 443-9753.

### Tuning OS/2

Clear & Simple, Inc. is now offering Performance 2.1 PLUS, an upgrade to its tun-

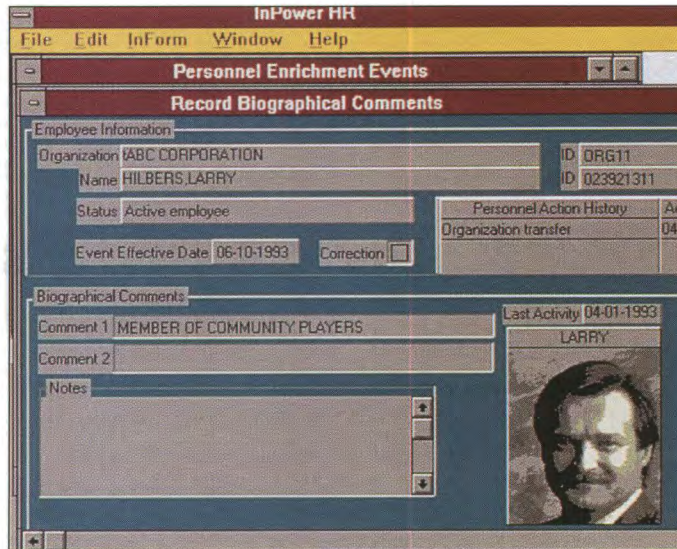


## MARKETLINE

ing and utility kit for OS/2. The package focuses on drive and file maintenance and file backup. Also included is SimplBAK, which enables users to create a custom program object that backs up new and modified files automatically. The price of Performance 2.1 PLUS is \$39.95. Clear & Simple, Inc., P.O. Box 130, West Simsbury, CT 06092, (203) 658-1204, fax (203) 651-0354.

### Controlling compensation

Clayton Wallis has released and is now shipping CompExec for DOS and OS/2. This compensation planning, management, and analysis software is designed for use by both small and large organizations in both the public and private sectors. The product combines a database design with descriptive and inferential statistical capabilities. It features presentation quality 2-D and 3-D graphics capabilities and century-aware date functions that enable users to make future projections easily. CompExec is available in two



Users can choose to integrate InPower HR into an existing environment or to select a platform on which to standardize for the future.

workstation editions and a workgroup edition. The Standard Edition for OS/2 and DOS has an introductory price of \$4,995 for a single workstation. Clayton Wallis, P.O. Box 310, El Verano, CA 95433-0310, (707) 996-0967, fax (707) 996-0839.

### Back up your workgroup

Cheyenne Software, Inc., developers of storage management software, has released ARCsolo for OS/2, which

provides storage management capabilities for workgroups and standalone OS/2, DOS, and Macintosh clients.

ARCsolo operates in small workgroup settings on peer-to-peer networks. The File Tracking System database maintains records of all backed-up files and directories, allowing users to track the number of versions of a file that have been saved. The utility also helps automate data management by scheduling one backup scheme for an entire workgroup—including laptops—rather than for just one machine at a time.

ARCsolo for OS/2 runs on workstations with OS/2 2.1 and later, and requires 8-16mb of memory. The OS/2 version is priced at \$395. Cheyenne Software, Inc., 3 Expressway Plaza, Roslyn Heights, NY 11577, (516) 484-5110, fax (516) 484-2489.

### HR Power

Integral is now shipping InPower HR 1.1, a user-driven

client/server human resources application that can run simultaneously on different relational databases, hardware, and operating system platforms. The product features a database information archive, restore and retrieve capabilities, and a library of statutory personnel reports, all designed to help organizations comply with legal requirements. InPower also provides fully integrated letter writing ability, invoice printing, and accounts receivable functions. Pricing starts at \$125,000 and is based on the number of users and the hardware configuration. Integral, 2185 North California Blvd., Walnut Creek, CA 94596, (510) 939-3900, fax (510) 944-1416.



Interface's Message Server systems combine e-mail and voice mail in a single unit.

### Message, please

Interface has released the first of a new generation of platform-independent, OS/2-based Message Servers that combine e-mail and voice mail in a single unit tied to a LAN. The products work with voice mail systems, allowing e-mail messages to be copied directly to a voice mailbox where they can be retrieved by dialing in with a telephone, thereby



Analytical options in CompExec are closely integrated between database, statistic, and graphic options.



## MARKETLINE

eliminating the need for a modem.

Interface provides integrated turnkey units, including the server and voice hardware, network and operating system software, and voice, e-mail, and fax software installed and ready to use. Units can accommodate up to 288 ports with a capacity of 1,750 hours of voice storage. Fully configured systems start at under \$10,000. Interface, 747 Pacific Avenue, Salt Lake City, UT 84104, (801) 521-4600, fax (801) 359-2800.

### Client/Server PARTS

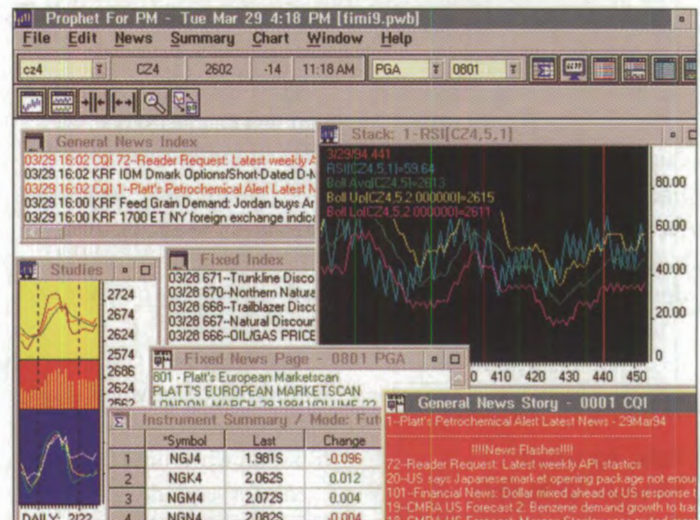
Digitalk, Inc. is shipping the PARTS Communications Wrapper for EHLLAPI (Emulator High-Level Language Application Programming Interface), an add-on component of PARTS Workbench for OS/2. The Communications Wrapper, designed for corporate users needing GUI front ends to their legacy 3270/ 5250 mainframe systems, is an object oriented client/server framework that integrates

components written in different languages with legacy mainframe systems. The Wrapper supports IBM Communications Manager as well as other EHLLAPI products compatible with Communications Manager on OS/2. The cost is \$995. Digitalk, Inc., 5 Hutton Center Drive, Santa Ana, CA 92707, (714) 513-3000, fax (714) 513-3100.

### Prophetic trader

Financial Information Management is now shipping Prophet, a client/server application for institutional traders. The product combines centralized data management with trading tools, graphics, and trading workstations that can be customized.

Prophet integrates market data feeds to display news, stock quotes, and charts. It includes parabolic and Bollinger Band studies and chart overlays, and also enables traders to display historical data. Prophet runs under OS/2 and DOS/Windows. Leasing starts at under \$200 per month per worksta-



Financial Information Management's Prophet is a real-time trading application designed for institutional traders.

tion. Financial Information Management, Inc., 11000 West 78th Street, Suite 250, Eden Prairie, MN 55344, (800) 532-0136, fax (612) 941-7017.

### Networking by Artisoft

Artisoft, Inc., is now shipping LANtastic v. 6.0, networking software that provides access to NetWare, Windows NT, and OS/2 LAN servers. The release features Server Message Block client support,

which enables users to access any SMB-based server for file and print services. The product also features e-mail, faxing, and paging capabilities. Users can also track day-to-day appointments and long range plans with the network scheduling feature. LANtastic v. 6.0 is offered at \$119 per node with 1-, 5-, 10-, 25-, 50-, and 100-user kits available. Artisoft, Inc., 2202 North Forbes Blvd., Tucson, AZ 85745, (800) 846-9726, fax (602) 670-7101.

## News

### MSR, Iomega sign backup deal

MSR Development has signed an agreement to bundle a version of its backup software with Iomega Corp.'s tape drives. As first reported in *OS/2 Week*, the two companies have been negotiating the deal since last fall and finally closed the deal in March.

The result is Iomega for OS/2, a proprietary version of MSR's backup software that will enable cross-platform backup and recovery of data. The backup system will require OS/2 2.1; initially it will run in 8mb of memory, but MSR is currently working to lower the memory requirement to 4-6mb. Iomega is dis-

tributing the software as an upgrade to its existing base of tape drive users and bundled with drives for new buyers.

### Preloading to start by year's end

Ambra Computer Corp. has announced that it expects to begin preloading OS/2 on its systems on request by the end

of this year. Company officials say the matter is actively being pursued with executives of IBM's Personal Software Products division in Austin, Texas.

In late 1993, Ambra, an IBM subsidiary that reports to the PC division, committed itself to preloading OS/2. Since then, however, it has



## MARKETLINE

run into a series of logistical problems. Craig Conrad, Ambra's marketing director, explained that the delay was caused by the challenge of configuring the operating system for the variety of CD-ROMs, tape backups, video cards, and drives Ambra uses in its PCs.

Ambra is continuing to ship its computers with DOS and Windows preloaded.

### Talk to your Sound Blaster

Creative Labs Inc., a major sound card manufacturer, is close to completing Voice Assist for OS/2, its first OS/2 speech product. At press time, the company was hoping to announce the product by

the end of April.

Voice Assist for OS/2 is a discrete speech software utility that will enable users to control any application in the OS/2 environment by using multiple-word commands. It will require a 16-bit sound card such as the company's Sound Blasters.

Sources close to the project report that Creative Labs marketers are discussing distribution with three channels: hardware vendors such as Compaq and Dell, which would preload the utility on multimedia PCs; developers of database, spreadsheet, and word processing software; and IBM. According to one source, IBM is considering

the possibility of bundling the new product with OS/2.

Creative Labs is hoping this product will be the product it needs to bridge the gap between its home and corporate clients. Currently, about 85 percent of the company's sales are to home users.

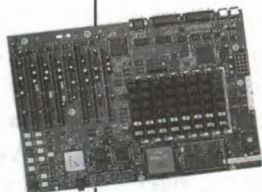
### Software Store will focus on key shows

IBM's PSP Software Store has decided to step down its presence on the trade show circuit. Instead of having a major presence at the ever-growing number of trade shows, IBM will now focus its energies on a handful of major events, including the two Comdexes, PC Expo, and one

or more of the OS/2 Interchanges. Big Blue's profile at these shows will remain high with fully staffed booths. The smaller shows also will be attended by IBM representatives, although PSP's sales operation will have a considerably lower profile.

### A box marketed Taligent

Taligent Inc. has been quietly working toward establishing a visible retail presence. Within the next several months, watch for the appearance on store shelves of shrink-wrapped boxes bearing the Taligent name. The first product most likely will be a developers' toolkit. ♦



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# OS/2 Inter-Process Communication

## Semaphores

BY CAREY GREGORY

**W**hen building robust multithreaded or multiprocess applications in a preemptive multitasking environment, a mechanism for controlling and coordinating the activities of the various threads and processes is absolutely essential. While some sources of conflict are obvious, such as when two processes write to the same file simultaneously, others are not so apparent. Take the simple example of a counter accessed by two threads. It's tempting to assume that incrementing the counter is an atomic operation (thus safely usable without enabling a locking mechanism).

Unfortunately, this is rarely true. Although C's operator appears atomic as a C construct, consider the following expression and its Intel assembly language counterpart (generated by the compiler):

C Expression:

```
Count = ++Counter;
```

Compiler output:

```
MOV  EAX,Counter ; move Counter to the
                        EAX register
INC  EAX          ; increment it
MOV  Counter,EAX  ; save it
MOV  Count,EAX    ; and store it
                        in Count
```

Within this example, there are three points where the operation can be interrupted with potentially erroneous results. If two threads were to start executing this series of instructions and the operating system switched from one thread to the other in mid stream, the resulting values of **Count** and **Counter** could depend on the point of interruption rather than on the proper count. This is known as a *race condition*, and it is by far the most frustrating type of bug to find and correct. Race conditions are often difficult to reproduce and typically occur at unpredictable intervals.

### LISTING 1

```
#define INCL_DOS
#define INCL_DOSERRORS
#include <os2.h>
#include <iostream.h>

static HMUX      hmutex;
static HMTX      hOutputMutex;
static HEV       hStartEvent,
                hStopEvent,
                hCounter,
                hStopped[5];

static void APIENTRY
    ThreadFunction(ULONG ThreadNumber);

void main()
{
    // create a mutex semaphore to control
    // access to the output device
    DosCreateMutexSem(NULL, &hOutputMutex, 0, FALSE);
    // create start & stop event semaphores,
    // plus a counter semaphore
    DosCreateEventSem(NULL, &hStartEvent, 0, FALSE);
    DosCreateEventSem(NULL, &hStopEvent, 0, FALSE);
    DosCreateEventSem(NULL, &hCounter, 0, FALSE);
    // start some threads to compete for
    // the output device
    TID      tid;
    SEMRECORD SemRec[5];
    for (ULONG i = 0; i < 5; i++)
    {
        DosCreateThread(&tid, ThreadFunction,
                        i, 0, 32768);
        DosCreateEventSem(NULL, &hStopped[i],
                        0, FALSE);
        SemRec[i].hsemCur=(void *)hStopped[i];
        SemRec[i].ulUser = i;
    }
}
```



## CODE CACHE

```

}
// create a mux semaphore to determine
// when threads have stopped
DosCreateMuxWaitSem(NULL, &hmux, i,
                    SemRec, DCMW_WAIT_ANY);
// tell the threads to start
DosPostEventSem(hStartEvent);
// now snooze a while and let the children play
DosSleep(10000);
// tell the threads to stop
DosPostEventSem(hStopEvent);
// wait until they've all stopped
ULONG ThreadNumber;
for (i = 0; i < 5; i++)
{
    DosWaitMuxWaitSem(hmux, SEM_INDEFINITE_WAIT,
                    &ThreadNumber);
    // acquire ownership of the output

```

When faced with resource contention problems such as this, you have several courses of action available. You could, for example, bracket the code with **DosEnterCritSec()** and **DosExitCritSec()** calls. **DosEnterCritSec()** freezes all other threads in the current process until **DosExitCritSec()** is called. However, you should avoid such brute force techniques where possible. After all, not every thread in the process may affect the protected resource, and freezing unrelated threads could adversely impact overall performance. In general, I find OS/2's critical section API useful only in certain very limited circumstances, and I recommend avoiding it where possible.

Another alternative is to serialize operations on shared resources by building a separate "worker" thread to handle these tasks. The calling function places requests on a queue owned by the worker thread. The worker thread reads the requests and carries them out one at a time, thus ensuring serialized operations and preventing race con-

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## CODE CACHE

ditions between threads. Worker threads work quite well in certain circumstances—most notably those in which results are not required immediately and the requesting thread cannot afford to wait for a locked resource to become available (a PM thread, for example).

However, building worker threads adds a high level of complexity and generates far too much code (and overhead) for something so simple as manipulating a shared variable. Moreover, since the results of the operation aren't available immediately, this approach simply won't work in many situations.

The remaining option available through OS/2 is called a *semaphore*. As the name implies, a semaphore is little more than a flag—but it's a flag supplied by the operating system that imparts several very useful properties. The OS/2 semaphores come in three distinctly different flavors (mutex, event, and muxwait), each with its own particular purpose and distinct API (as summarized in the following sections).

```
// device and print a message
DosRequestMutexSem(hOutputMutex,
                    SEM_INDEFINITE_WAIT);
cout << "Thread " << ThreadNumber <<
    " has stopped.\n";
DosReleaseMutexSem(hOutputMutex);
// delete the semaphore from the mux wait list
DosDeleteMuxWaitSem(hmux,
                    (HSEM)hStopped[ThreadNumber]);
}
// get & print the value of the
// event semaphore used for counting
ULONG Count;
DosQueryEventSem(hCounter, &Count);
cout << "All threads have stopped. A total of "
    << Count << " lines were printed.\n";
// close all the semaphores
DosCloseMutexSem(hOutputMutex);
```

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```

    DosCloseEventSem(hStartEvent);
    DosCloseEventSem(hStopEvent);
    DosCloseEventSem(hCounter);
    for (i = 0; i < 5; i++)
        DosCloseEventSem(hStopped[i]);
    return;
}

static void APIENTRY
    ThreadFunction(ULONG ThreadNumber)
{
    // wait for the start event
    DosWaitEventSem(hStartEvent,
        SEM_INDEFINITE_WAIT);
    // now loop infinitely until the stop
    // event semaphore is posted
    while ((DosWaitEventSem(hStopEvent,
        SEM_IMMEDIATE_RETURN)) == ERROR_TIMEOUT)
    {
        // acquire ownership of the output device
        DosRequestMutexSem(hOutputMutex,
            SEM_INDEFINITE_WAIT);
        // bump the counter & say hello
        DosPostEventSem(hCounter);
        cout << "Thread number " << ThreadNumber
            << " is running.\n";
        // release ownership
        DosReleaseMutexSem(hOutputMutex);
    }
    // signal that we're stopping
    DosPostEventSem(hStopped[ThreadNumber]);
}

```

Note that in the description of OS/2 semaphores the term *thread* includes threads in different processes (as well as the more common use of multiple threads within one process). All three types of semaphores may be used by either single or multiple processes as well.

## Mutex Semaphores

The rather strange name of mutex semaphore derives from its function: it provides MUTual EXclusion. In other words, it's specifically designed to solve the counter incrementing problem described above. In order to guarantee correct results in our counter incrementing problem, we begin by creating a mutex semaphore using the **DosCreateMutexSem()** function. This function returns a handle to the semaphore. With the semaphore handle we can now call **DosRequestMutexSem()** before accessing the counter, and **DosReleaseMutexSem()** when we're done.

**DosRequestMutexSem()** requests ownership of the semaphore and will block the calling thread if another thread owns the semaphore (an optional time-out parameter may be supplied). When the owning thread calls **DosReleaseMutexSem()**, the requesting thread obtains ownership and continues. The central concept of mutex semaphores is ownership.

Ownership of the semaphore implies ownership of the resource it represents, and the programmer can create a semaphore to represent any resource she chooses, including purely conceptual ones. If all threads that access a given resource first request ownership of its associated semaphore, OS/2 guarantees that two threads will never access the resource simultaneously.

## Event Semaphores

The purpose of event semaphores is not to control access to shared resources, but rather to provide a signalling and synchronization mechanism between threads. An event semaphore has two states: posted or cleared. Essentially, an event semaphore in the cleared state has a value of zero; in the posted state it has a non-zero value. When a thread calls **DosWaitEventSem()**, it will block until the semaphore clears (again, a time-out value may be specified). When another thread calls **DosPostEventSem()**, the blocked thread is released. With every call to **DosPostEventSem()**, the post count of the semaphore



## CODE CACHE

is increased by one and it remains in the posted state until reset to zero with the **DosResetEventSem()** function.

The fact that event semaphores maintain a post count rather than just a binary posted/clear state can be very useful. The purpose is to provide a thread with an actual event count rather than just a simple notification. Normally you should not use event semaphores as counters when a simple variable will suffice. However, when a counter must be shared between processes, using an event semaphore as a counter would usually be preferable to shared memory (which requires more overhead).

An event semaphore could also be used to solve our counter incrementing problem by replacing the variable Counter with an event semaphore: incrementing it with **DosPostEventSem()**, obtaining its value with **DosQueryEventSem()**, and resetting it with **DosResetEventSem()**.

### MuxWait Semaphores

The muxwait semaphore is another strange-sounding variety. This name derives from the data communications term *mux*, which is shorthand for multiplexer. A multiplexer carries multiple signals on a single channel, and that is exactly what a muxwait semaphore does. It lets you detect state changes in several semaphores with a single function call. To create a muxwait semaphore you must first establish one or more mutex or event semaphores (these are the semaphores you will monitor). The monitored semaphores are placed in an array and passed to the **DosCreateMuxWaitSem()** function. With the returned muxwait semaphore handle, you may wait for triggers on any (or all) of the semaphores you specified in the array. Unlike an event semaphore, which triggers when posted, a mutex semaphore triggers when released.

The all versus any choice must be made upon semaphore creation, and the array of semaphores to monitor must be of matching types (i.e., you cannot supply a mixed array of event and mutex semaphores). Muxwait semaphores aren't particularly useful in our counter incrementing problem, though we could stretch things a bit by using several event semaphores as counters and a muxwait semaphore as a signal when any of the counters increment.

Listing 1 provides a more practical example of muxwait semaphore usage, along with both event and mutex semaphores. The program creates a scenario where race conditions are inevitable and demonstrates how mutex, event, and muxwait semaphores can exercise complete control over the execution of the threads, eliminate all race conditions, and reliably manipulate shared variables.



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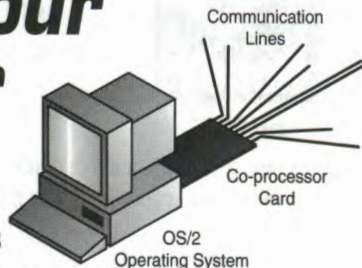
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The premise is simple: five threads will be started and each will enter an infinite loop in which it writes a message to the screen. Without some type of locking mechanism for access to the screen, the output from the threads will be intermingled and confusing. You can demonstrate this to yourself by commenting out the calls to **DosRequestMutexSem()** and **DosReleaseMutexSem()** in **ThreadFunction()**.

The program begins by creating all of the necessary semaphores and threads. The program uses 10 semaphores, and the purpose of each is as follows:

**hOutputMutex:** A mutex semaphore used to control access to the screen.

**hStartEvent:** An event semaphore used to signal threads to start.

**hStopEvent:** An event semaphore used to signal threads to stop.

**hCounter:** An event semaphore used to count the number of lines written to the screen.

**hStopped:** An array of five event semaphores. One is assigned to each of the five threads, which posts upon termination.

**hmux:** A muxwait semaphore used to monitor the five semaphores in the **hStopped** array.

Note that although the program creates five threads, it defines only one thread function. This is perfectly acceptable: each thread becomes an independent instance of one function with its own context (i.e., its own stack space and register set). Since the thread function's first action is a call to **DosWaitEventSem()**, each of the five threads will block until the **hStartEvent** semaphore is posted. This allows the main thread to complete its thread and semaphore creation before any of the threads start running. When the main thread completes its creation of all child threads, it creates a muxwait semaphore using the array of event semaphores associated with the child threads. All five threads start with a single post to the **hStartEvent** semaphore.

At post time, each of the five child threads begins competing for the screen. Since access to the screen is controlled by a mutex semaphore, only one thread at a time will be allowed to write to the screen (resulting in perfectly distinct and organized output). Without the mutex semaphore, the output would be mingled and unreadable.

Simply as a demonstration of the counting abilities of event semaphores, each thread also posts the **hCounter** semaphore each time it writes to the screen. Of course, we could have obtained an accurate count by simply incrementing a global variable instead—the call to **DosRequestMutexSem()** within the



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child thread would protect the global variable from corruption just as the call protects the integrity of the output.

Notice that the **while** loop continues until **DosWaitEventSem()** returns something other than **ERROR\_TIMEOUT**. Since we are calling **DosWaitEventSem()** in the loop with the time-out value **SEM\_IMMEDIATE\_RETURN**, the call does not block if the semaphore is not posted as it would if we gave an actual millisecond time-out value or the value **SEM\_INDEFINITE\_WAIT**. Although this construct represents a polling loop (something to be avoided in OS/2 since polling is rarely necessary and always inefficient), it demonstrates the flexibility of the event semaphore wait function and allows the main thread to terminate the child threads by simply posting the **hStopEvent** semaphore.

As each child thread falls out of its loop, it immediately posts the event semaphore that was assigned by the main thread. This, in turn, causes the main thread to return from the call to **DosWaitMuxWaitSem()**. The main thread then deletes that thread's event semaphore from the muxwait list. If it did not either delete the semaphore from the wait list or reset it using **DosReset-EventSem()**, the posted semaphore in the list would cause **DosWaitMuxWaitSem()** to return on every subsequent call.

When all of the child threads have terminated, the main thread queries the value of the **hCounter** event semaphore using **DosQueryEventSem()**, and then does what every good program should do: free all of its resources. Although OS/2 will meticulously release all resources when a process terminates, including semaphores, I think it's still a good practice to clear resources explicitly.

You will find extensive documentation on several additional semaphore functions in the OS/2 Toolkit. But once you understand the basics presented here, you've mastered everything required to write robust, reliable multithreaded and multiprocess applications for OS/2. The next step then, would be to look toward the final major tool in OS/2's IPC toolbox: named and anonymous pipes—a feature that will take you beyond your local workstation into the client/server arena. ♦

---

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# THE IS NOTEBOOK

*Tips and Techniques for the OS/2 Professional*

## Chemistry Set

BY GORDON SCOTT & GENE STEELE

**N**ative communications software in an OS/2 environment is a formula for good chemistry. Running DOS-based communications software, on the other hand, is all but alchemy to the uninformed.

OS/2's preemptive multitasking makes it a natural for running communications software in the background. Cooperative processing software and client/server environments especially benefit from the combination of background communications and preemptive multitasking. But OS/2's normal operation can wreak havoc on a DOS-based communications program if several things aren't in place.

Though most DOS and Windows communications programs run fine under OS/2, many will benefit from tuning their settings and your OS/2 system for communications. Some software companies even publish information about OS/2's DOS settings or installation commands to help you with this. The over-the-modem game DOOM, for instance, includes a list of recommended DOS settings for use in an OS/2 session, and the makers of Telemate also include similar information.

If the program you run has no such information available, here are some techniques you can try that will help you squeeze the most out of your DOS-based communications packages—until, that is, you replace them with OS/2 programs offering greater efficiency.

### Upgrade to OS/2-based communications packages.

- Check your favorite software source for 32-bit communications programs that run native under OS/2.

The best way to avoid communications problems with OS/2 is to use OS/2 communications programs instead of DOS-based ones. While not strictly necessary, upgrading to an OS/2 application may improve your productivity enough to make up for the cost of switching from DOS.

One noteworthy OS/2 product is Person to Person for OS/2. In addition to modem, serial port, printer port, or LAN chat and file transfer capabilities, this program lets users share their OS/2 clipboards, share "Chalkboards," shadow running applications, and transmit audio and video. It brings a new definition to the term "communications" software.

Some other examples of OS/2 programs include HyperAccess/5 for OS/2, PMComm and TE/2 for calling BBS systems (or as a simple host or text mode remote system control program), Fax/PM and FaxWorks for seamless 32-bit fax capability from other running applications, MAXIMUM/2 (a BBS system), and LinkRight for LapLink-style file transfer between machines (but with the benefit of background execution).

As you may surmise from the list, communications is one of the most widely developed software categories within OS/2. This comes as no surprise to users of OS/2-based communications, who have discovered the ad-

vantages of native OS/2 execution. These programs greatly reduce communications problems while taking full advantage of OS/2's multitasking.

As an intermediate step, you might check to see whether your DOS communications programs, or the ones you're considering, are "OS/2-aware." A DOS communications program that is OS/2-aware tends to allow more intense multitasking by handing unnecessarily allocated time slices back to the CPU.

### Use an internal modem or serial port that includes a 16550 UART buffering chip.

- Check the box label on any internal modem or serial card you buy. A 16550 UART chip is a big enough selling point these days that a manufacturer wouldn't fail to mention its presence.
- Check your existing serial card for a 16550 UART chip. (The UART chips are mounted in sockets and will normally be 40-pin chips about two inches long and a little over one-half inch wide).
- Replace 16450 UART chips (if you're brave) with 16550s by gently prying old chips loose and replacing them with the newer chips.

Using 16550AFN UART-based modems (or serial ports) can greatly reduce demands placed on OS/2 by all forms of serial communications. This can improve the performance of all DOS, Windows, and even OS/2 communications programs and device drivers. Because OS/2 may need to vary the CPU activity of any given program



at any given time, communications programs—which need regular attention from the computer—are natural targets for disaster.

The 16550 chip can endure longer periods of inattention from the computer (due to a larger internal buffer). This insulates your communications programs from data loss and garbled file transfers by smoothing over the varying frequency of access the CPU grants to COM ports during multitasking.

**If you have a 16550 UART serial card, make sure the buffering capability is enabled.**

- Open an OS/2 session.
- At the command prompt, enter: `MODE COM2` (or whatever COM port you use for modem communications). OS/2 presents a list of attributes for the serial port.
- Note the value of the `BUFFER=` setting.
- If OS/2 reports `BUFFER = N/A` then OS/2 does not see a buffered UART on that COM port and there's nothing more you can do. If it says `BUFFER = OFF`, you need to turn it on.
- At the command prompt, enter: `MODE COM2 BUFFER=ON` (or whatever COM port your modem is connected to).

You can make this condition permanent by adding the `MODE` line to the `STARTUP.CMD` file in the root directory, or your OS/2 drive, or by adding a line with the appropriate parameters to your `CONFIG.SYS` file.

**Use an alternate communications driver that "virtualizes" access to the COM ports.**

- Look for a copy of Raymond L. Gwinn's SIO drivers. (SIO120.ZIP or a later release) on local BBS systems or get the latest version from BIX, CompuServe, Prodigy, or the IBM OS/2 BBS. The drivers are also on the Hobbes OS/2 CD-ROM and available over the

Internet from FTP site **HOBBS.-NMSU.EDU**.

- Install the drivers on your system as replacements for `COM.SYS` and `VCOM.SYS`.

These drivers act as a serial communications traffic cop, regulating the flow of data to and from the COM ports under OS/2. So if you don't have the 16550 chip, you can still benefit from this form of buffering. Nevertheless, even with buffered UARTs, these drivers can improve the behavior of serial input and output operations on many systems. If you are having communications problems, this potential fix is easy to try. The SIO drivers will also add new DOS settings to your settings notebook (which typically will not need to be changed).

The procedure for installing the SIO drivers is quite well documented, although some required information may be difficult to track down. For example, the standard addresses for various communications ports aren't mentioned (most communications adapters list the settings if you can find the manual). If you plan to install the SIO drivers and can't find your manuals, keep your copy of *OS/2 Professional* handy and refer to the following table:

PORT	Address	Interrupt
COM1,	03F8,	IRQ 4
COM2,	02F8,	IRQ 3
COM3,	3E8,	IRQ 5 **
COM4,	2E8,	IRQ 2 or 7 **

\*\* Use caution when selecting the IRQ numbers. IRQ 2, 5, and 7 are not dedicated to COM ports, so another device might be using them already (such as LPT2, or a sound card—both of which might use IRQ 5).

Most machines ship with two COM ports, but you can add more. Unfortunately, COM3 and COM4 don't have standard IRQ settings. In DOS they typically share the same IRQ as COM1 and COM2, but under OS/2 this is not recommended (hence the alternate settings noted in the table

above). There are, however, some co-processed multiple-serial port cards that run several COM ports on a single IRQ. Other I/O boards will let you use higher IRQs (numbers 10-15) for additional COM and printer ports.

Interrupts and addresses are set directly on the adapter (via jumpers, switches, or sometimes software) and sometimes in OS/2's `CONFIG.SYS` file as well. OS/2 already knows the standard settings for COM1 and COM2, but if you have more than two COM ports you will need to inform OS/2. Add a line to your `CONFIG.SYS` file to specify the COM port number, the address, and the IRQ number.

For example:  
`DEVICE=C:\OS2\COM.SYS`  
`(3,3E8,5) (4,2E8,2)`

**Diminish communication problems caused by too many interrupts.**

- Edit your `CONFIG.SYS` file.
- Add a fourth parameter to the `COM.SYS` `DEVICE` statement, for example:  
`DEVICE=C:\OS2\COM.SYS (1,3F8,4,I)`  
`(2,2F8,3,I) (3,3E8,11,I) (4,2E8,15,I)`

The fourth parameter, "I", tells OS/2 to ignore indications that individual processes are overloading the interrupt channel.

OS/2 slows to a crawl when it encounters too many consecutive interrupts running a DOS or Windows program. Your communications or FAX program may lock up or seriously slow down OS/2 if it causes more than 1,000 interrupts per second. (Note: 16550 UARTs reduce the number of interrupts per second.)

**Enable Hardware Handshaking.**

- Edit your `CONFIG.SYS` file.



## THE IS NOTEBOOK

- Add lines similar to the following:  
CALL=C:\OS2\MODE.COM  
COM1:38400,N,8,1,OCTS=OFF,RTS=  
ON,BUFFER=ON  
CALL=C:\OS2\MODE.COM  
COM2:38400,N,8,1,OCTS=OFF,RTS=  
ON,BUFFER=ON

Some telecommunications software supports (or even requires) a feature called "Hardware Handshaking." Hardware Handshaking lets the serial port and modem control signals for synchronization and error handling that improve communications flow. For some systems it can make a big difference.

You should look in your communications software's manual for an explanation of the program's support of the first two parameters. Normally, OS/2 sets OCTS and RTS to OFF. The documentation for your program may suggest that one or both of these be set to ON. (Note that the sample CONFIG.SYS shown above uses the aforementioned BUFFER=ON parameter to enable the 16550 UART buffers.)

The MODE command may be called from CONFIG.SYS (as illustrated), run from a command prompt, or included as one of the steps in a batch or REXX command used to start your communications program.

For more information on the MODE command, type: Help MODE at an OS/2 command prompt.

### Set time-slicing to reduce amount of time any one process can control the CPU.

- Edit your CONFIG.SYS file.
- Add this line: SET TIMESLICE=40, 125.

This provides you with more evenly distributed CPU time. The numbers of the TIMESLICE command represent times in milliseconds. The first number is the minimum amount of CPU time any single process can use at once. The

second number is the limit of time any single process can remain idle. These numbers represent a good starting point for tuning communications programs. However, the numbers that give the best performance may vary depending on the characteristics of your system, so you should feel free to tweak the settings until you get satisfactory results.

Note that OS/2's own algorithms for time-slicing (used when TIMESLICE does not appear in CONFIG.SYS) are usually optimal, but there are a few exceptions among DOS-based communications programs.

To further tune an OS/2 system for communications, search the help system for PRIORITY and take a look at PRIORITY=ABSOLUTE, which negates OS/2's dynamic foreground processing boost. Another parameter, PRIORITY\_DISK\_IO=NO, may help file transfers by preventing foreground applications from getting DISK I/O priority over applications running in the background.

### Adjust DOS settings by experimenting with one or all of the following suggestions.

- Open the DOS settings for your communications program.
- Set IDLE\_SENSITIVITY to 100.
- Set COM\_HOLD to ON.
- Set COM\_SELECT to the number of the COM Port your program will use.
- Set HW\_TIMER to ON.
- Set HW\_RAM\_TO\_ROM to ON.

You can eliminate or reduce transmission errors during OS/2 communications by simply using the proper DOS settings for communications programs. These settings have varying effects on different systems. Push the Help button while viewing the DOS settings and follow the "Related Information" for detailed descriptions of all of the DOS settings.

### Run your DOS-based communications packages from an image of a specific-DOS session.

- Consult the TNT column in the November 1993 issue of *OS/2 Professional* (or type HELP VMDISK from an OS/2 command line) for the steps used to make the image file.
- Open the DOS settings from the icon of your DOS-based communications program.
- Select DOS\_STARTUP\_DRIVE.
- Specify the fully qualified path of the image and its filename.

You can run your communications software in a true DOS session. This represents one of the surest ways you can operate your DOS programs—while you still have them—and get the benefits of crash protection and multi-tasking from OS/2. ♦

*Gordon and Gene both work for different divisions of IBM located in San Jose, California. Gordon can be reached via the Internet by sending e-mail to gscott@stlvm22.vnet.ibm.com. Gene and his son operate a by-invitation-only BBS in the 408 area code.*



## BYTES & PIECES

continued from page 17

Although users may have been looking for more in the upgrade, the truly dramatic changes are being held back for version 4.0 which, at press time, was slated for a Sept. 15 release. Among the features planned for that release are a complete GUI interface (with drag-and-drop capabilities), SMP support, a streamlined installation process that integrates OS/2, LAPS, and LAN Server on a single CD-ROM, a more concise manual, and REXX-enabled macro features.

There is one much anticipated feature that will not make the final cut. DCE will not be ready in time for the early fall release, thereby delaying cross-platform security support. Instead, DCE is expected to hit beta testing in December and be released as an add-on.

LAN Server currently is installed on about one-fifth of all LAN installations. IBM estimates a seven percent

market share for its product, compared to about 65 percent for the market leader, Novell's NetWare.

### 'Computer, ...'

When last we visited the back lots of Hollywood, Paramount Pictures Corp. was not pleased with IBM's continued use of *Star Trek*-related code names for new projects under development. The two companies were reported to be "discussing" the situation.

That's not the only thing they're discussing. *OS/2 Professional* has learned that Big Blue is exploring the possibility of installing IBM computers on the Enterprise itself. The company wants to convince Paramount to display the IBM logo on every Enterprise PC, laptop, and PDA seen on the sets of *Star Trek: The Next Generation*.

Now, suppose Paramount were to consider folding some elements of Stanley Kubrick's *2001: A Space Odyssey*

into the *Star Trek* series, among them giving the ship's computer a name: do you think Jean-Luc might look at the screen, and say, "Lou, ..."?

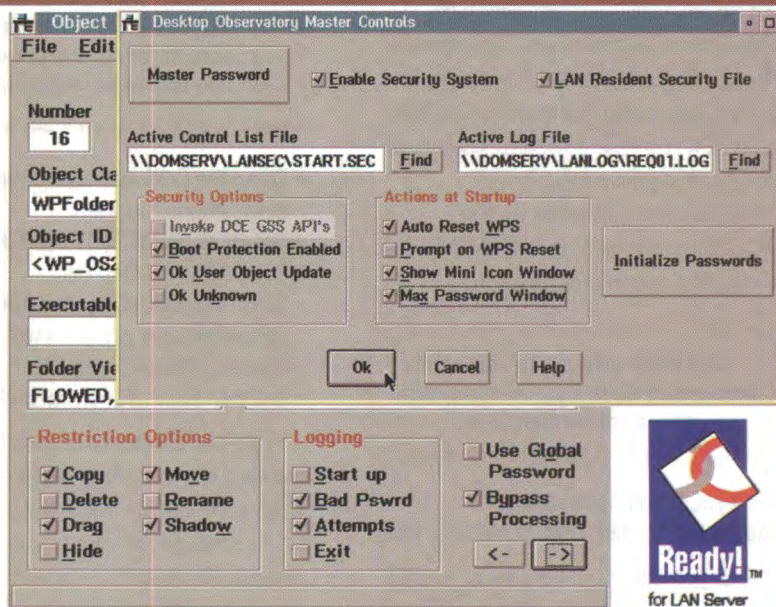
### OS/2 Professional CD-ROM

More than 1,200 OS/2 shareware, free-ware, and demoware programs and tools, as well as scores of important OS/2 resources are now conveniently assembled on the *OS/2 Professional* CD-ROM. The CD-ROM is available for \$25 through OS/2 Express by calling 800-OS2-KWIK. Arranged for simple access with colorful graphics, the *OS/2 Professional* CD-ROM is the must library for developers, Team OS/2, and anyone else interested in the diversity of OS/2 software. The CD-ROM is equipped with an object-oriented WPS Application for installing programs and accessing information about all entries. ♦

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## BOOKSTAX

# Client/Server Programming with OS/2 2.1

by Robert Orfali and Dan Harkey, Van Nostrand Reinhold, 1,142 pages, \$39.95

REVIEWED BY ALAN JAY WEINER

**T**he third edition of *Client/Server Programming with OS/2 2.1* is a tour-de-force on everything from OS/2 programming to network communications. The book contains far more information than its simple title implies, including database tools, SOM, and using the Workplace Shell to create an Object Oriented User Interface (OOUI). This third edition has been completely updated to OS/2 2.1.

It's almost two books in one: a tutorial on system fundamentals and a guide to programming. Starting by examining what client/server means to software, the authors cover a myriad of topics while they build an actual application. Each topic is examined in sufficient detail for the reader to understand it without becoming bogged down in technical minutiae.

Examining the requirements of client and server and what an operating system should supply to each, the authors conclude OS/2 is an excellent choice for both. By comparison, the competition falls short; they're suitable either for the client or the server, but not both.

Having chosen OS/2, the authors proceed to an overview of its capabilities. Many of them are common to any OS/2 program; processes, threads, memory management, and dynamic linking are all familiar to any OS/2 programmer.

*Client/Server Programming with OS/2 2.1* includes architectural overviews of several of the OS/2 extensions—NTS/2 (Network Transport Services/2), Communications Manager/2, and the database manager extensions DB2/2 and DDCS/2. Tutorials cover the use of NETBIOS, TCP/IP, NetWare, and LAN Server.

As the authors delve deeper into OS/2 programming they build several programs to demonstrate the concepts being discussed. To introduce general OS/2 programming they start with a simple "Hello World" program that detaches itself, running in the

background. At a specified time of day it pops up in a window. Another utility terminates the detached program. Proceeding to multitasking fundamentals, they write a tool to show the effects of changing levels and priorities on tasks by comparing processes and threads.

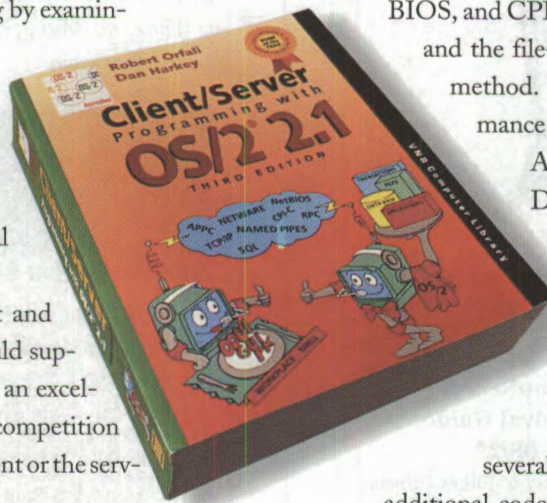
Tutorials examine the various communications methods that a client and server might use. A simple file-transfer program demonstrates the use of Named Pipes, TCP/IP, NETBIOS, and CPI-C/APPC. Each is examined in detail, and the file-transfer utility is modified to use that method. A final comparison provides performance statistics.

Additional tutorials teach you to program DB2/2. This large section covers the database manager's APIs, and builds both a utility (RSQL) to drive the manager and scripts to direct the utility.

TP1 is a benchmark used to measure the performance of transaction servers. The authors combine several of the utilities already built (with some additional code) to create a version of TP1, then run it on several configurations and compare their strengths and weaknesses.

Finally, the authors build a sample client/server application, the "Club Med" application. Acting as a tool to assist in selecting a vacation destination, it builds on the previous topics. SOM and Workplace Shell objects provide the object oriented user interface. It is here, using SOM as a vehicle, that the authors take a run at OS/2's future.

SOM complies with the Common Object Request Broker (CORBA) defined by the Object Management Group. The OMG is a consortium of more than 160 members whose goal is to create platform-independent communications for distributed objects. CORBA permits objects to be passed between dissimi-





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## BOOKSTAX

lar machines and programming languages. The authors believe IBM's DSOM (Distributed SOM) is so important that it may be OS/2's "killer app"—the magical application that will thrust OS/2 into widespread acceptance.

*Client/Server Programming with OS/2 2.1*'s only faults are the lack of a glossary and of a diskette. There are a tremendous number of acronyms and a glossary would be extremely helpful. The programs listed in the book are not included on diskette; one is available by mail order for an additional \$34.95.

While it's obviously aimed at programmers, *Client/Server Programming with OS/2 2.1* will be useful to anyone needing to understand the inner workings of OS/2 and its extensions. Even though it covers hard-core technology, it's easy to read. Occasional whimsy helps to break up otherwise tedious detail ("From Berkeley to OS/2 With Love" details the differences between Unix and OS/2 TCP/IP sockets).

It is a book worthy of anyone's bookshelf. ♦

Alan Weiner is president of Technology 21, a consulting firm located in Waltham, Massachusetts. He can be reached on the Internet as [aweiner@bix.com](mailto:aweiner@bix.com).

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# Dvorak's Guide to OS/2, Version 2.1

by John C. Dvorak, David B. Whittle, and Martin McElroy,  
Random House Electronic Publishing, 786 pages, \$45

REVIEWED BY GAIL OSTROW

*[Editor's note: In October 1993 we published a review of Dvorak's Guide to OS/2 written by a writer unfamiliar with OS/2 who evaluated the book from that perspective. Here's another view of it, from an OS/2 veteran.]*

**T**his is a *big* book! And I don't mean simply its size, although it weighs in at about two pounds, or its title, which goes on forever. No, this book is big in scope and depth, a true reference book that covers topics I hadn't even thought I needed until I saw them. And all delivered in John Dvorak's inimitable style—affable, reassuring, advisory, calming, insightful, and never, ever condescending (except just once and I will get to that shortly). Together with Dave Whittle and Martin McElroy, Dvorak delivers the kind of information OS/2 users would ask for if they knew it existed.

Well, it does, and it's all here in one very accessible package.

The organization is superbly simple: present the background information quickly and painlessly and move on to the meat. The authors begin with a brief overview. This is followed by an honest discussion of OS/2's hardware requirements, which in turn is followed by an introduction to the OS/2 operating system—one that actually includes a relevant description of the Apple Macintosh and its place in the history of the "desktop." Then there is an all-too-short discussion of installing OS/2. (Recalling the comment in the introduction that Dvorak's 15-year old son had installed OS/2 on numerous systems without any trouble, I pictured the author shaking his head ruefully from side to side, wondering what all the noise and confusion was about.) Finally, there is a thorough description of the Workplace Shell that users at all levels of expertise will benefit from.

That said and done, the book begins in earnest. What OS/2 user wouldn't kill for the ability to understand and optimize the

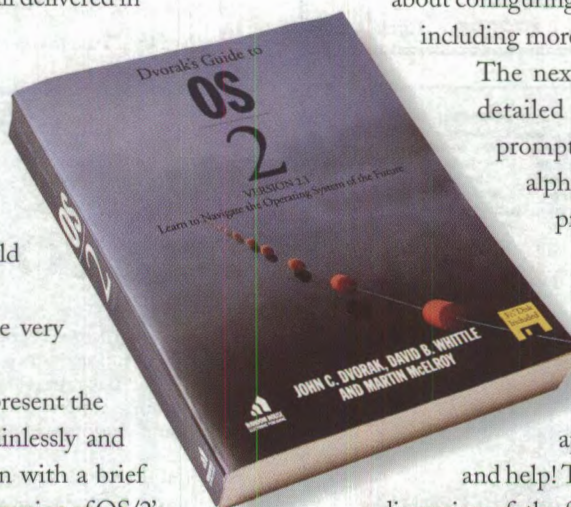
CONFIG.SYS file? Dvorak takes the mystery out of the more common file entries by explaining exactly what each command does and why and how you would change it. Tips, hints, cautions, and warnings are also included to guide the uninitiated through the process; if you are left wanting more, you can simply peruse the very comprehensive BBS listing in Appendix B.

Complementing the CONFIG.SYS section is a chapter on fine-tuning a DOS session; everything you ever wanted to know about configuring and optimizing DOS settings is here, including more insider hints and tips.

The next two chapters contain a complete, detailed reference for all the command line prompts and commands; they are arranged alphabetically and are full of valuable and practical information.

The remaining eight chapters present cogent descriptions of OS/2-related features: REXX, communications and networking, client/server computing, applets, application development, multimedia, and help! The section ends with The Crystal Ball, a discussion of the future of OS/2. As expected, each section contains useful hints and tips and guidance on where to go for additional information, all delivered in that reassuring "I'm just here to help you" style.

After all that, they saved the best for last. The appendices alone are worth the price of the book. Appendix A, Useful Tips, Tricks, and Techniques, is a book in itself—here is where all the insider knowledge comes together in one beautiful benefit for the reader. Everything from installing, configuring, and optimizing to working with the most common and popular PC applications is here in one handy reference. Appendix B, BBSs Across the World, contains enough information to keep you in cyberspace for the rest of your life. I can't wait until I retire and can go browsing through all the entries!





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## BOOKSTAX

Appendix C, IBM Personal Computer Company Automated Fax System Catalog, is the nicest surprise of all. Imagine: 24-hour, 7-days-a-week free information available at the touch of a phone and fax machine or fax modem. How did we not know about this until now? Appendix D, Error Messages, is a mixed blessing: you may find exactly what to do when you receive a particular error message, or you may be totally overwhelmed by how many error messages there are. In either event, you can't ever again say you didn't know.

Then there is the Glossary, a short comfortable walk through the jargon of OS/2 computing. And finally, nestled in an envelope inside the back cover, there is the diskette, which is chock full of shareware utilities, fonts, and graphics—an impressive addition to an impressive book.

If you add only one reference book to your OS/2 library, this should be the one. In a world where there is less and less one can count on, it's nice to know that John Dvorak is still around to guide us through the latest technology. ♦

*Gail Ostrow has been writing in and about the microcomputer business for more than 15 years. Currently, she is the publishing liaison for the OS/2 Independent Vendor League.*

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## INPUT

*continued from page 15*

to either install or use OS/2 2.x. Isn't it about time that this small minority stopped getting the lion's share of the press in your Input section? There are 4.5 million copies of OS/2 2.x out there! If everyone is having all of these horrible problems with it, why is it selling?

I run a small company up on the Alaska Highway and therefore don't see hundreds of copies of OS/2, but I've been able to convince a number of my customers and friends to try it. There hasn't been one system that it wouldn't load on properly, and only one system has had trouble with it. And that system was an older 386 with a suspect BIOS, but it still ran! As a matter of fact, I'm sending this letter on an Everex LX/20 laptop based on a

386SX/20 CPU with only 5mb of RAM and a 60mb hard drive and OS/2 2.1 runs just fine. I just thought that I'd get my nickel's worth in.

**Rick Saunders**

*Fort Nelson, British Columbia, Canada*

### **Moonflower BBS**


I am writing to inform you of what is arguably one of the largest OS/2 BBSs in North America: the Moonflower BBS. We have been on-line for three years and we began running the system under OS/2 2.0 a few days after it went GA. We have been doing so ever since. We have the entire Hobbes Internet OS/2 file collection on-line in CD-ROM format, along with another 500 megs of OS/2 shareware, drivers, fixes, updates, and graphics files on the

hard drives. We received and make available for download nearly seven megs of new OS/2 files each week.

We have just under 50 message conferences on every OS/2 topic, from all the major worldwide networks including UseNet, Fidonet, OS/2net, and IBMnet. We currently have six incoming lines, all high speed-capable, and we support up to 28.8kbps V.42 data rate connections. Our main access phone number is (509) 891-0250 and basic access to the system is free of charge. Our goal is to make OS/2-related files and information as widely available as possible.

**Peter Link**

*Spokane, Washington ♦*



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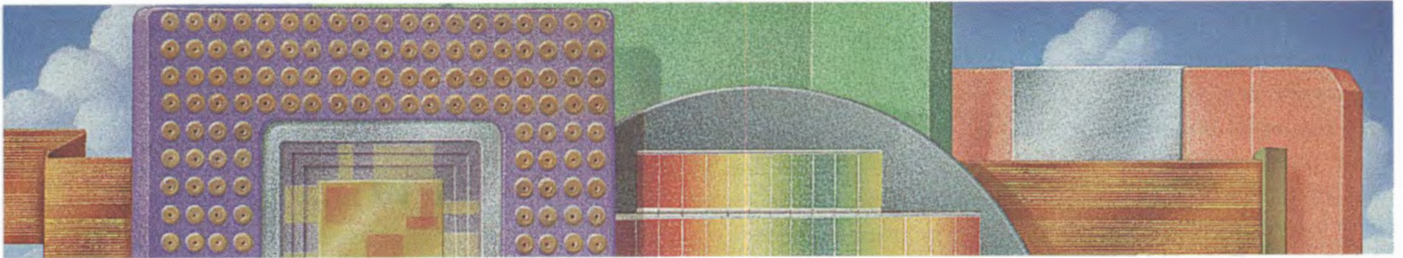
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#### PC EXPO

##### New York, NY

More than 98,000 attendees and 800 exhibitors are expected to attend PC Expo New York, which will cover the computing landscape with emphases on computer hardware, software, portable and pen-based computing, multimedia, client/server technology, and networking. The comprehensive seminar series will feature more than 60 sessions and eight in-depth tutorials. Andrew Grove, president and CEO of Intel, will deliver this year's keynote address. A variety of registration packages are available. Advance registration (before June 13) for tutorial and full conference is \$475; thereafter the price is \$575. Contact: BBI, (800) 829-3976.

### JUNE 28-30

#### DATABASE AND CLIENT/SERVER WORLD Boston, MA

Database World is teaming up with Client/Server World to offer more than 10 major conferences in this one event.

Conferences topics will include Database Technologies, PC Database and Xbase, Database Application Development, Client/Server Applications, Enterprise Database Connectivity, Network Management, and more. More than 100 technical and managerial sessions will explore current technologies in client/server and database development, and more than 500 exhibitors will present the newest software development tools available for PCs, workstations, mini-computers, and mainframes. Special events will include the Systems Integration Corner, Super-Server Showcase, Industry Spotlight, and an Object Oriented Client/Server Solutions Showcase. Will Zachmann, president of Canopus Research and senior contributing editor of *OS/2 Professional*, will deliver a keynote address on "Reality Behind the Client/Server Myth."

A three-day conference package is available for \$995 and the Expo is free to the public. Contact: DCI, (508) 470-3880.

### JULY 26-28

#### ENTERPRISE COMPUTING EXPO '94

##### Chicago, IL

This event will offer senior business and IS professionals the products, education, and services required for effective enterprise computing. Con-

ference sessions and exhibits will highlight client/server computing, interoperability and open systems, distributed databases, network management, and more.

Tutorials are \$195 each. The Re-Engineering program is \$995. The Information Passport is \$795 and includes Enterprise Technologies Program, Windows World Conference, and all tutorials. The Enterprise Technologies Program is \$595 for all days and \$250 for one day. Contact: The Interface Group, (617) 449-6600.

### JULY 27-29

#### OBJECT WORLD

##### San Francisco, CA

The fourth annual Object World Expo will focus on the strategic role of object technology. The event will include 80 conference sessions and 12 tutorials for beginner, intermediate, and advanced computer users on the business and practical uses of object technology. One hundred exhibitors are expected to display their softwares. The show will include a panel discussion on the future of software with panelists Philippe Kahn, president and CEO of Borland International, Steve Jobs, president and CEO of NeXT Inc., Joe Guglielmi, chairman and CEO of Taligent, Inc., and Jim Allchin, vice president of Microsoft.

Conference costs range from \$300 to \$1,200 with early bird discounts available until June 17. Contact: Object World, (800) 225-4698. ♦





# IBM's Living Fossils

BY JERRY POURNELLE

**I**BM needs to improve OS/2, but that's a symptom. The real problem is marketing. IBM knows how to market hardware to large customers, but not software to the public. Worse, the company seems organized to resist any changes whatsoever. Unfortunately, unless something changes pretty soon, OS/2 is doomed to become a backwater, a small low-market-share niche product.

It may be that Louis V. Gerstner Jr., who has been CEO at IBM for one year now, will change things. But a lot of change is needed, and time is running out. True, OS/2 may not loom all that large in his field of vision. But IBM needs some real changes in corporate culture. If Gerstner can make companywide cultural changes in time, that will save OS/2 as well as the rest of the company.

Back in Tom Watson's time, IBM could make use of innovative young tigers. Over time, the company got large enough that it needed rules and procedures—red tape and bureaucracy—but there were ways to cut across that to empower people who could get things done. In those days the way to get ahead was to make IBM's customers happy.

No more. Now the best way to get ahead at IBM is to study the rules and play corporate political games. That ought to remind you of AT&T in the days when it couldn't market eternal life; indeed, sometimes I think IBM learned marketing from The Phone Company before AT&T hooked up with NCR.

The personnel rules at IBM are so inflexible that it doesn't matter how valuable you are, or how valuable your top management thinks you are. You can be a real tiger, but that's not important. What counts are your official "appraisals," which are prepared by middle managers. A top manager can't promote someone into management until middle management is satisfied—which

means, not until all initiative has been beaten out and the management candidate will never, ever, disagree with his immediate superiors. Then he or she is ready for management. And until one gets to management, one has no power whatsoever.

Journalists generally help each other out. If I need a contact in a company I don't know much about, most colleagues will give me a name and phone number. Not so at IBM; finding someone within the company who will tell you anything without going through formal interview arrangements is so difficult that when you find one, you guard that contact with almost insane jealousy.

It doesn't matter, though: chances are pretty good that IBM will find out that someone is doing good for the company outside regular channels and move that person to a completely new area of the company.

That's particularly true of marketers. Lucy Baney launched OS/2 2.0 despite the company's monomaniacal determination to continue shipping OS/2 1.3; then John Patrick built Team OS/2 and actually generated some enthusiasm for the product among developers. Where are they now?

IBM has some great troops pushing OS/2; unfortunately they're all down in the ranks, and held there by middle managers determined to enforce rules no matter what that does to the company. What Gerstner needs to do is the same thing Dan Goldin should do at NASA: build a dinosaur farm. "You, sir, are going to the Land of NOD: the No Output Division. Your assignment is to read the memos of the other people in NOD. Once a year you may send me a one-page memo; otherwise if I hear from you or of you, you are fired. Have a nice day."

With the dinosaurs out of the way, the company would bloom—fast. ♦





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